British Guiana.

# ANNUAL REPORT

OF THE

# DIRECTOR OF AGRICULTURE

FOR THE YEAR

# 1956.

(Printed by the Authority of His Excellency the Governor).

N.S.P.
R.A.M.
M.M.

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# PREFACE

## General Statement of Agricultural Policy for British Guiana, 1956

The general agricultural policy is to foster and increase the economic production of crops and livestock by enlarging areas under cultivation, by making better use of land with improved and higher yielding types of crops, by the use of fertilizers and the improvement of husbandry generally and to concentrate on and make the best use of measures to improve those crops which are particularly suited to conditions in the country and are already the dominant factors in the agricultural economy namely, sugar, rice, milk and beef production, coconuts and food crops.

An essential element of the policy is the introduction, testing and encouragement of new crops which may be suitable for the country and the importation of suitable breeds of animals for improvement of livestock production, with a view to diversifying agricultural production, and affording new opportunities to farmers to improve their economic status and generally raise the standard of living in a predominantly agricultural country.

To implement this policy the Department undertakes extensive and intensive research into the problems of agriculture generally to seek information and provide a sound basis for advising the farming community. It provides an Extension Service to disseminate new ideas and give practical help to the farmers and, in co-operation with all other departments and agencies, seeks to provide the necessary advice and guidance on the agricultural development of the country as a whole.

The policy adopted in achieving this objective will be:-

(i) to give priority to measures which will provide an early increase in economic agricultural production. This will include:-

  (a) undertaking research into methods of increasing the efficiency and volume of agricultural production;

  (b) providing extension services to farmers and training in scientific agriculture for staff and suitable members of the farming community, particularly youths;

  (c) organising and rationalising marketing and processing of produce to enable the farmer to obtain the maximum return for his produce.

(ii) to ensure that the cultivated lands of the coastal plain and river banks are used to the best advantage, the development of new areas, having particular regard to efficient production and the maintenance of soil fertility;

(iii) to co-operate with agencies providing adequate credit to farmers on terms commensurate with their standard of development and their sense of responsibility in such matters;

(iv) to investigate and encourage the agricultural development of the Interior with the view, firstly, of making the indigenous population as self-supporting as possible and, secondly, of developing non-perishable high value crops for export; and

(v) to work in close collaboration with and to assist all agencies connected with rural and interior development.

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# SECTION I

## AGRICULTURE IN THE COLONY

### WEATHER CONDITIONS

The total rainfall for the year was 120.90 inches as compared with 111.63 inches in 1955 and with 92.06 inches, the average precipitation over the past 76 years (1880-1955).

2. The general distribution of rainfall was rather uneven, the first four months being typical. The long wet season commenced in May and continued to the end of September, with totals of 14.46, 12.99, 15.71, 12.99 and 13.60 inches respectively. The total for September was 5.75 inches higher than the 1955 record for this month. December was very wet, the total being 17.35 inches.

3. Rain fell on 248 days of the year as compared with 268 days in 1955. The heaviest fall for any one day was 3.40 inches on 1st December.

4. The highest shade temperature for the year was 88.2°F. on 5th November, the record being 93.0°F. on 22nd September, 1955.

### CROPS

#### SUGAR

Output

5. In 1956, 263,333 tons of sugar were produced, 258,615 tons by estates and 4,718 tons by cane farmers. This was a record for the industry, exceeding the 1955 production by 13,222 tons.

6. 76,577 acres of sugar-cane were reaped, of which 70,236 acres were reaped by estates and the remainder by cane farmers. The average yield in tons commercial sugar per acre for all varieties on estates again rose from 3.40 in 1955 to 3.67 in 1956. The average yield for the industry was 3.47 tons commercial sugar per acre compared with 3.23 tons per acre in 1955.

7. Table I gives details of production for the year.

Varieties

8. In 1956, B.37161 and B.41227 were the main varieties reaped, the former showing a marked increase in acreage over the previous year. The acreage of B.4098 continued to fall. Of the newer varieties, B.47225 showed a marked increase but is unlikely to be further extended. B.47258 may become a major cane. The variety position is dictated by yielding ability and tolerance or resistance to Leaf Scald disease.

9. The following Table shows the distribution of varieties grown on sugar plantations and reaped in 1956:-

TABLE I

SUGAR AND RUM STATISTICS, BRITISH GUIANA, 1955 - 1956

| Year | Area reaped (including farmers' canes) - English acres | | | Sugar produced (including farmers' canes) - Tons | | | Yield per acre - Tons | | | Rum produced - Proof gallons | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Berbice | Demerara | Colony | Berbice | Demerara | Colony | Berbice | Demerara | Colony | Berbice | Demerara | Colony |
| 1955 | 30,160 | 47,340 | 77,500 | 98,489 | 151,622 | 250,111 | 3.27 | 3.20 | 3.23 | 1,046,180 | 1,758,100 | 2,804,280 |
| 1956 | 30,217 | 46,360 | 76,577* | 98,826 | 164,507 | 263,333 | 3.44 | 3.49 | 3.47 | 1,185,468 | 2,127,474 | 3,312,942 |

* Estimated

TABLE II

| Variety | Acres 1955 | Acres 1956 | Percentage distribution in the Colony 1955 | 1956 |
|---|---|---|---|---|
| B.37161 | 21,250.9 | 29,134.8 | 29.6 | 39.5 |
| B.41227 | 24,618.4 | 22,901.5 | 34.3 | 31.0 |
| B.4098 | 7,406.8 | 5,959.7 | 10.3 | 8.1 |
| B.47225 | 574.7 | 3,668.6 | .8 | 5.0 |
| B.4362 | 3,255.3 | 3,433.5 | 4.5 | 4.6 |
| B.34104 | 9,570.1 | 1,951.6 | 13.3 | 2.6 |
| Pindar | - | 1,269.1 | - | 1.7 |
| Co.419 | 999.0 | 1,011.1 | 1.4 | 1.4 |
| B.40105 | 1,098.6 | 625.0 | 1.5 | .8 |
| B.47258 | - | 508.7 | - | .7 |
| B.46378 | - | 467.4 | - | .6 |
| D.37/45 | 359.7 | 425.0 | .5 | .6 |
| B.47379 | - | 334.7 | - | .5 |
| Other varieties | 2,729.3 | 2,137.1 | 3.8 | 2.9 |
| Total | 71,864.5 | 73,827.8 | 100.0 | 100.0 |

Pests and Diseases

10. Leaf Scald disease was controlled by the use of resistant varieties and need not be a threat to the industry as long as vigilance is maintained and sporadic outbreaks controlled.

11. The Froghopper continues to cause some loss of crop. Effective control is maintained by the use of BHC dusts.

Fertilizers

12. The quantities of and the expenditure on the various fertilizers used on the sugar estates in British Guiana for the years 1955 and 1956 are presented in Table III.

13. The application of nitrogen in the form of sulphate of ammonia remains at the usual standard rates. The rate of application of phosphates has increased as has that of potash although, when considered in relation to the acreage under cane, the amounts of phosphatic and potasic fertilizers applied at present must be regarded as being on a modest scale. The tonnage of limestone purchased decreased appreciably mainly owing to the increase in cost of this item.

14. The expenditure on fertilizers and limestone by the industry exceeded three million dollars in 1956 ($3,019,686), which is 11.1% higher than that of the previous year ($2,721,664).

Marketing

15. Total exports of sugar amounted to 245,911 tons, an increase of 3,385 tons on the exports for 1955. The average export price rose to $167.26 per ton compared with that for 1955 of $165.97 per ton. Similarly, the export of rum rose by 456,155 proof gallons to 2,616,372 proof gallons, but the f.o.b. price fell by 2 cents per proof gallon to $1.43 per proof gallon. The exports of molasses fell by 634,763 gallons to 6,209,188 gallons, but the f.o.b. price rose by 5 cents per gallon to 16 cents per gallon.

## TABLE III

## VALUES AND QUANTITIES OF FERTILISERS USED ON SUGAR ESTATES, 1955 - 1956

| | Ammonium Sulphate | | Basic Slag | | Superphosphate | | Hyperphos. | | Muriate of Pot. | | Sulph. of Pot. | | Limestone | | Urea | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1955 | 1956 | 1955 | 1956 | 1955 | 1956 | 1955 | 1956 | 1955 | 1956 | 1955 | 1956 | 1955 | 1956 | 1955 | 1956 |
| Quantity - Tons | 14,212 | 14,708 | 67 | 5 | 2,876 | 3,058 | 1,017 | 1,504 | 645 | 1,149 | 393 | 175 | 14,552 | 11,492 | 33 | 153 |
| Value - $ | 1,708,630 | 1,871,436 | 1,600 | 1,196 | 478,676 | 519,603 | 88,193 | 138,492 | 74,631 | 134,412 | 45,720 | 22,373 | 315,652 | 292,157 | 8,562 | 40,017 |
| Cost per Ton - $ | 120.22 | 127.24 | 24.00 | 260.02 | 166.43 | 169.90 | 86.75 | 92.08 | 115.74 | 116.94 | 116.29 | 127.20 | 21.69 | 25.42 | 255.95 | 261.79 |
| % of Total Quantity | 42.0 | 45.6 | 0.2 | - | 8.5 | 9.5 | 3.0 | 4.7 | 1.9 | 3.6 | 1.2 | 0.5 | 43.1 | 35.6 | 0.1 | 0.5 |
| % of Total Value | 62.8 | 62.0 | 0.1 | - | 17.6 | 17.2 | 3.2 | 4.6 | 2.7 | 4.5 | 1.7 | 0.7 | 11.6 | 9.7 | 0.3 | 1.3 |

## TABLE IV

## EXPORTS OF SUGAR AND BY-PRODUCTS, BRITISH GUIANA, 1955 - 1956

| Year | Sugar | | | Rum | | | Molasses | | |
|---|---|---|---|---|---|---|---|---|---|
| | Tons | Value | Value per ton f.o.b. | Proof Gallons | Value | Value per gallon f.o.b. | Gallons | Value | Value per gallon f.o.b. |
| 1955 | 242,526 | $40,251,775<br>£8,385,786 | $165.97<br>£34.58 | 2,160,217 | $3,136,071<br>£653,348.1 | $1.45<br>£0.30 | 6,843,951 | $767,237<br>£151,841 | $0.11<br>£0.02 |
| 1956 | 245,911 | $41,622,197<br>£8,671,291 | $169.26<br>£35.26 | 2,616,372 | $3,752,792<br>£781,831.6 | $1.43<br>£0.30 | 6,209,188 | $992,492<br>£206,769.2 | $0.16<br>£0.03 |

16. Exports of sugar to the United Kingdom under the Commonwealth Sugar Agreement were 162,607 tons at $195.60 per ton c.i.f.

17. Local sales of sugar increased by 539 tons to 17,919 tons. Similarly, local sales of rum rose to 510,689 proof gallons by 14,960 proof gallons.

18. Table IV summarises the export trade in sugar, rum and molasses.

## RICE

### Output

19. There was a decrease in the acreage under rice and in production as compared with 1955. The total area cultivated for the autumn crop was 118,469 acres, producing an estimated yield of 73,039 tons of rice. Including the spring crop, rice was cultivated on 136,000 acres compared with 171,900 acres in 1955, producing an estimated 78,500 tons of rice compared with 89,100 tons in 1955. Table V summarises the production of rice.

TABLE V

| Year | Total Estimated Acres (Spring and Autumn Crops) | | | | Estimated Yield |
|---|---|---|---|---|---|
| | Berbice | Demerara | Essequibo | Total | Tons of Rice |
| 1955 | 65,000 | 63,600 | 43,300 | 171,900 | 89,100 |
| 1956 | 54,200 | 53,800 | 28,000 | 136,000 | 78,500 |

### Supply of Pure Line Seed

20. Pure line seed padi was produced at the Anna Regina and Cane Grove Land Settlements under the supervision of the Department of Agriculture. Production at the latter settlement was being attempted for the first time in an effort to reduce the high transport costs involved in distribution from Anna Regina. A total of 13,174 bags (140 lb. net) was available from the 1955 crop for distribution in 1956, producers being paid $7.55 per bag. This seed was despatched to Agricultural Officers in all rice growing districts and was sold to farmers at $8.86 per bag, with the exception of Essequibo Coast where the price was $8.56 per bag.

21. The steady improvement in the yield of padi on farmers' lands and in the quality of marketed rice in certain areas is due largely to this scheme which has become an integral part of the organisation of the industry.

22. Notwithstanding this scheme, rice farmers in all districts were encouraged to produce their own pure line seed under supervision of Agricultural Instructors. This seed was purchased subsequently by the Department, then handed over to the Rice Producers' Association for resale to farmers. The price structure for this seed padi was essentially similar to that from Anna Regina. 348 bags were available for distribution from this source.

## Marketing

### B.G. Rice Marketing Board

23. The B.G. Rice Marketing Board continued to be responsible for the internal and export marketing of the entire production of rice.

24. The quantity of rice delivered to the Board during its financial year 1st October, 1955 to 30th September, 1956 was 752,807 bags (180 lb. gross weight) equivalent to 60,493 tons. This represents a decrease of 74,347 bags on the quantity delivered to the Board during the previous crop year.

25. The price structure of both padi and rice remained unaltered from the previous crop year. The prices of rice were as follows:-

| Grade | Price |
|---|---|
| Extra Super | $18.80 |
| Super | 17.95 |
| Extra No. 1 | 16.90 |
| No. 1 | 16.00 |
| No. 2 | 14.00 |
| No. 3 | 12.00 |
| Super Broken | 8.40 |
| Broken | 7.20 |
| Unclassified | 6.30 |
| White A | 17.50 |
| White B | 14.00 |
| White Broken | 8.40 |

26. The minimum buying price of dry, clean and well winnowed padi was $6.00 per bag of 140 lb. net.

27. The selling prices of rice for export to the British West Indies having contracts with the Board were:-

| | | |
|---|---|---|
| Super | - | $19.50 f.o.b. per bag of 180 lb. |
| First quality | - | $17.85 " " " " " " |
| Second quality | - | $16.05 " " " " " " |

Local selling prices varied from $17.05 per bag for Brown A to $6.00 per bag for Stockfeed rice.

28. Exports of rice in 1956 fell to 41,326 tons valued at $9,855,654 compared with 53,249 tons valued at $12,515,745 in the previous year. The average price received rose by $3.44 to $238.48 per ton over that for 1955. Local sales and retention by growers amounted to 30,330 tons.

### B.G. Rice Development Company

29. The Company continued to operate central mills at Mahaicony/Abary and Anna Regina. Construction of the new mill at Anna Regina was completed and it was opened in March.

30. The Company purchased the following quantities of padi for the year:-

Mahaicony/Abary

| | | |
|---|---|---|
| (a) From Company's cultivation | 29,388 bags | (140 lb. |
| (b) From farmers .. .. | 228,200 " | net ea.) |
| Anna Regina | 257,588 " | |
| From farmers .. .. | 135,948 " | |
| Total .. | 393,536 bags | |

Machinery

31. Interest in mechanisation of the rice industry was maintained as prices remained favourable. 252 tractors valued at $1,192,785 were imported compared with 175 tractors in the previous year. The importation of combine harvester-threshers rose from 5 in 1955 to 16.

32. Assistance was also given by the continued issue of duty-free petrol for rice cultivation and harvesting. Rice received greater assistance from this measure than any other agricultural pursuit as illustrated by the issue of 402,185 gallons to the rice industry out of a total issue for the year of 542,384 gallons. The balance was issued to the following industries: sugar received 129,804 gallons, ranching 3,780 gallons and miscellaneous industries 6,615 gallons.

33. Land Settlements and the Rice Producers Association continued their hire service of machines to farmers. The Government machinery pool containing draglines, bulldozers and pumps continued to render valuable service to the farming community.

Pests and Diseases

34. There were no serious outbreaks of insect pests or disease. Blast (Piricularia oryzae) was observed in the West Demerara and the Demerara River Districts. Grain spotting was reported in the Berbice River District, probably due to an organism of the genus Curvularia.

Fertilizers

35. Several demonstrations of the effect of fertilizers on rice yields were carried out on farmers' holdings containing toxic soils. Considerable interest was shown in the increased yeilds obtained.

Rice (Security of Tenure) Ordinance

36. A new Rice (Security of Tenure) Ordinance was introduced as from 1st October. Its main provisions were:-

(a) The fixing of a basic rent per acre, determined by the soil type and the average yield in different zones of the Colony.

(b) It permits additions to the basic rent for:

(i) drainage and irrigation rates;
(ii) conservancy water rates;
(iii) local authority rates; and
(iv) estate maintenance charges.

(c) The appointment of Assessment Committees for each zone to hear and determine appeals.

(d) Tenants can be evicted only under certain conditions.

COCONUTS

37. The coconut industry continued largely unchanged in regard to scale and methods of production. The acreage under this crop was probably the same (31,500 acres) as in 1955. The major areas for coconuts are the narrow sand reefs along the coastal belt most, if not all, of which are fully developed and the banks of creeks and rivers, especially near the mouths, where drainage is good.

38. The yield of nuts or copra per acre is generally very low due to many factors, but mainly neglect of spacing, drainage, weeding and pest control. The extraction of oil from copra is efficient as judged by the percentage of copra meal recovered from the tonnage of copra processed.

39. Interest in copra manufacture was maintained, but there was still need for more artificial driers in the districts. There was much activity by small farmers who continued to produce sun dried copra under inefficient drying conditions.

40. Table VI hereunder shows the production of various coconut products in 1956 compared with 1954 and 1955.

TABLE VI

| Year | Copra (tons) | Copra Meal (Lb.) | Recovery of Meal from Copra | Edible Oil (Glns.) | Crude Oil (Glns.) | Soap (Lb.) | Margarine and Compound Lard (Lb.) |
|---|---|---|---|---|---|---|---|
| 1954 | 5,276 | 3,913,524 | 33.1% | 678,845 | 253,643 | 3,959,579 | 284,108 |
| 1955 | 6,114 | 4,393,951 | 32.1% | 777,853 | 241,078 | 4,123,150 | 240,249 |
| 1956 | 5,468 | 3,901,694 | 31.9% | 696,440 | 230,567 | 4,454,762 | 636,818 |

Grading

41. Copra grading continued. There was no change in the prices fixed in 1954, that is, £58 6s. 8d. per ton for Grade I, £56 0s. 0d. for Grade II and £53 13s. 4d. for Grade III. A greater price differential between grades is desirable to stimulate the production of higher quality copra.

Imports and Exports

42. 8,000 gallons of edible oil valued at $19,200 were exported to the Caribbean. No copra meal was exported.

Pests and Diseases

43. Attacks of the caterpillar, Brassolis sophorae declined in Berbice but increased in East Demerara. In the latter district, certain areas suffered severely before control by hand methods was achieved. One serious outbreak of the stem borer, Castnia daedalus occurred and was controlled by the application of Dieldrin.

44. Bronze Leaf Wilt was observed in the Essequibo and the East Demerara areas. Palms affected by "Little Leaf" and "Pencil Point" were common in poorly drained coconut fields. This condition is one of great age or premature senility due to poor drainage conditions. The cases observed were invariably due to the latter cause.

COFFEE

45. Interest in Liberica coffee continued during the year as the level of favourable prices was maintained. The rehabilitation of old estates and the planting of new areas continued. Exports increased by 79,408 lb. to 496,944 lb. valued at $378,293. The average value of bean exported in 1956 rose by 4½ cents to 76 cents per lb. compared with prices received in 1955.

46. Normal fluctuations in the incidence of Sclerotium disease was recorded in the North West and the Pomeroon River Districts. Disease incidence was low from January to June and began to spread from July. Economic measures of control are being sought.

CITRUS

47. Citrus cultivations were well maintained. Market prices continued to be attractive and there were no important outbreaks of pests and diseases. The demand for budded citrus plants continued at a high level.

48. Local production of oranges and grapefruit is still insufficient to meet the demand and imports have continued from Surinam and Trinidad. Exports of lime oil and lime juice are shown in Table VII below. Production of lime juice increased markedly although prices fell while that of lime oil fell although prices rose appreciably.

TABLE VII

| Year | Lime Juice | | | Lime Oil | | |
|---|---|---|---|---|---|---|
| | Quantity (gln.) | Value | Average price per gln. | Quantity (lb.) | Value | Average price per lb. |
| 1955 | 2,515 | $ 2,542<br>£529 | $1.01 | 1,598 | $ 9,839<br>£2,050 | $6.16 |
| 1956 | 14,891 | $12,658<br>£2,637.1 | $0.85 | 1,179 | $11,276<br>£2,349.2 | $9.56 |

FOOD CROPS

Roots and Plantains

49. Production of these crops was well maintained throughout the country. Unfortunately, floods experienced at the end of the year in the Pomeroon and North West Districts destroyed much of the standing food crops on farms. Purchases by the Marketing Division, compared with the previous year, fell by 208,098 lb. to 627,980 lb.

Pests and Diseases

50. Damage to plantains was caused by Castnia licoides in the Demerara River. Damage from Dynastid beetles and disfigurement of fruit by Colaspis hypochlora also occurred. Acoushi ants and cockles continued to cause damage to crops. Moka disease again occurred on the riverain areas, where it is endemic. Sigatoka disease affected susceptible varieties of bananas.

ANIMAL HEALTH

Foot-and-Mouth Disease

51. At the beginning of the year, restrictions were relaxed but, owing to fresh outbreaks in the Rio Brancho area, it was necessary to re-impose these in October. At the same time the cordon sanitaire fence was repaired as were all border crossing fences. Police patrols and rangers were re-posted at strategic crossings in order to prevent the spread of this disease into the Rupununi District. These precautions were still in operation at the close of the year.

52. The regulations made in 1954 against the movements of cattle to the coast from the Rupununi District and Brazil remained in force save that the cattle trail was left open.

Trypanosomiasis

53. Trypanosomiasis in horses occurred sporadically in the north savannahs of the Rupununi. Good results were obtained by treatment with Ethidium Bromide. Two suspected cases were encountered on the coast in imported horses.

Rabies

54. There were numerous outbreaks of Paralytic Rabies, particularly in the Rupununi. Many cases were confirmed by examination of brain specimens. This disease has now reached epidemic proportions in certain areas and is responsible for a heavy death rate. Vaccination was carried out in the worst hit areas, about 5,000 head being inoculated. At the end of the year, proposals were put forward to carry out a free vaccination programme in the Rupununi in 1957 in an endeavour to bring this disease under control.

Hepatogenous Photosensitisation

55. This disease, affecting savannah cattle, was investigated. Preparations have been made to commence work on preventive measures.

Mineral and Vitamin Deficiencies

56. Increased attention is being given to these two problems. The indications are that copper is one of the main deficiencies although there are others on the coastal area. On the savannahs, calcium, phosphorous as well as trace elements are necessary.

Swine Fever

57. During the early part of the year, there was a bad outbreak of Swine Fever with a death rate of over 100 pigs. Preventive inoculation quickly controlled this outbreak and no further outbreaks have occurred.

Poultry Diseases

58. Preventive inoculations have been used on a large scale to control diseases such as Newcastle, Fowl Pox and Infectious Bronchitis. Numerous post-mortems have been carried out with the result that two new diseases have been diagnosed in poultry.

59. An order was introduced to restrict the importation of poultry meat to eviscerated carcases in an effort to minimize the introduction of poultry diseases via such imports. It is almost certain that diseases, such as Newcastle, were introduced via the viscera of imported carcases.

General

60. Inspection of livestock entering the colony continued as a means of preventing the introduction of diseases.

DAIRY INDUSTRY

61. The amount of milk purchased by the Milk Control Organisation was 255,840 gallons compared with 209,137 gallons for 1955, an increase of 46,703 gallons on last year's purchases. The total production of milk was higher, however, with production from Bel Air and the lower East Coast Demerara District for which figures are not available. The sugar estates also continued to produce milk from their own herds for their staffs.

62. The Artificial Insemination Service continued to operate throughout the coastlands from Charity to Crabwood Creek as well as Bartica. 2,266 services were recorded compared with 2,132 for the previous year.

63. Pasture for dairy stock on the coastlands continued to be limited due to the expansion of rice production. Existing pastures are therefore poor and overgrazed which limits milk production.

64. The Milk Pasteurisation Plant is being erected and is expected to commence operation in July 1957. This plant should stimulate increased production and consumption of milk by assuring producers of a remunerative market for their milk and guaranteeing consumers a supply of clean, safe, pasteurised, fresh milk.

Imports of Milk Products

65. Imports continued to increase markedly. Table VIII records the position.

TABLE VIII

| Product | 1955 | | 1956 | | % Increase or Decrease |
|---|---|---|---|---|---|
| | Import (lb.) | Value | Import (lb.) | Value | |
| Condensed Milk (sweetened) | 4,296,459 | $1,084,437 £225,924.3 | 4,245,532 | $1,102,826 £229,755.4 | 1.2 decr. |
| Evaporated Milk | 4,225,391 | $ 960,541 £200,112.7 | 4,787,748 | $1,099,552 £229,073.3 | 13.3 incr. |
| Milk Powder | 773,982 | $ 540,577 £112,620.2 | 1,220,985 | $ 685,553 £142,823.5 | 57.7 incr. |
| Total | 9,295,832 | $2,585,555 £538.657.2 | 10,254,265 | $2,887,931 £601,652.2 | 10.3 incr. |

BEEF

66. The major centres of beef production are the coastal ranches, mainly limited liability companies, and the Rupununi savannahs. Research continues at the Ebini Livestock Station with a view to developing the intermediate savannahs for ranching. The beef supply is augumented on the coastlands by the sale of old cows and oxen by small farmers.

67. The cattle population of the coastal ranches is about 8,000 while it is in the vicinity of 47,000 head in the Rupununi. Of the 47,000 head in the interior savannahs, about 53% are owned by the Rupununi Development Company.

68. All cattle on the coast are delivered on the hoof to the abattoirs while the animals from the Rupununi savannahs are either sent to market on the coast over the cattle trail or slaughtered at the Lethem Abattoir and the carcases flown to Georgetown. 8,760 head of cattle were marketed in Georgetown, a decrease of 530 compared with 1955. Of this number, 2,821 head were slaughtered at the Lethem Abattoir and flown to the Georgetown market. The average price of beef to producers was 29½ cents per lb. dressed carcase weight, this being a slight reduction on the previous year.

69. The Lethem Abattoir was re-opened on the closure of the emergency abattoirs set up at Marakanata and Mountain Point. The Cold Storage Plant designed to operate in conjunction with the Lethem Abattoir commenced operations towards the end of the year.

70. Towards the end of the year the first half bred Santa Gertrudis calves commenced to come in. It was also clear that early consideration had to be given to the importation of beef type Zebu cattle to improve herds by crossing and to produce pure bred beef type Zebu bulls locally for sale to ranchers.

HIDES

71. The weight of hides exported was 332,093 lb. valued at $29,731, an increase on 1955's figures of 33,632 lb. valued at $9,010.

72. Although cattle were slaughtered in the Rupununi and beef flown to the city, it was possible to export more hides than in the previous year, as the cattle trail was re-opened and kept open for the greater part of the year.

PIGS

73. The number of pigs slaughtered in Georgetown for the year was 13,720, an increase of 6,527 over the slaughterings for 1955. This figure is made up as follows:-

| | |
|---|---|
| Municipal Abattoir | 5,989 |
| Ham and Bacon Factory (Department of Agriculture) | 7,731 |
| Total | 13,720 |

74. The pig industry continued to expand partly as the result of importation of new stock, dissemination of information to farmers on pig rearing, good feed mixtures and the success of the Department's Ham and Bacon Factory.

Production had increased to the point where it was possible to export 9,713 lb. of pork to Trinidad. An effort is being made to retain the export market by catering for the special requirements of the Trinidad market. The retail price for pork in Georgetown was 60 - 68 cents per lb.

SHEEP AND GOATS

75. Slaughterings of sheep at the Georgetown Abattoir increased by 41 head to 426 compared with the previous year. In addition, numerous sheep were slaughtered in rural areas. The quality of the mutton is not as good as it may be and steps are being taken to improve quality by the importation of bloodstock to be used for upgrading the local sheep. The retail price of local mutton varied from 68 - 72 cents per lb.

76. The rearing of milch goats in the Georgetown area continues. Two pure bred goats were imported by the Department to improve existing strains. 411 goats were slaughtered at the Georgetown Abattoir, a decrease of 22 animals on the previous year. As with sheep, this figure does not represent the total slaughterings of goats as appreciable numbers are slaughtered in rural areas.

POULTRY

77. The poultry industry continued to expand and the production of broilers doubled in the first eight months of the year. This was due to improved methods of production plus a quota system on importations to meet local requirements. It is hoped to encourage local production to the point where the home market will be fully supplied by local producers.

78. A total of 139,372 lb. of frozen eviscerated poultry valued at $96,869 was imported during the year under review, a decrease of 187,991 lb. (57.4%) compared with the previous year. The price for imported and local plucked frozen poultry ranged from 84 cents to $1.08 per lb.

IMPORTS OF MEAT PRODUCTS

79. Large quantities of meat products have still to be imported. Importations are summarised in Table IX.

BEEKEEPING

80. Weather conditions were again unfavourable for the third successive year. Beekeepers did well to maintain their production and obtain a reasonable return of honey. At the close of the year, there were 210 beekeepers, the majority of which keep only a few colonies of bees. The small beekeepers produced little surplus honey due to adverse weather conditions, production being maintained by the larger producers.

81. The estimated production of honey fell by 400 lb. to 85,000 lb. while that of beeswax remained the same at 1,600 lb. The value of both products was $25,000, a slight increase on the previous year. A ready local market at attractive prices existed and no honey nor beeswax was exported by the Beekeepers' Association.

TABLE IX

IMPORTS OF MEAT PRODUCTS

| | 1955 | | 1956 | | % Increase or Decrease |
|---|---|---|---|---|---|
| | Quantity (lb.) | Value ($) | Quantity (lb.) | Value ($) | |
| **Fresh Chilled or Frozen** | | | | | |
| Beef or veal | 206,597 | 84,227 | 216,348 | 91,428 | 4.7 incr. |
| Mutton | 83,738 | 36,316 | 95,756 | 46,465 | 11.4 incr. |
| Pork | 14,116 | 6,801 | 571 | 314 | 96.0 decr. |
| Other kinds (including poultry) | 346,851 | 181,367 | 155,173 | 104,008 | 55.3 decr. |
| **Dried, Salted or Smoked** | | | | | |
| Beef or veal, pickled | 1,158,649 | 442,206 | 1,146,550 | 385,251 | 1.0 decr. |
| Bacon and ham | 203,506 | 205,038 | 271,108 | 269,420 | 33.2 incr. |
| Pork, pickled | 761,200 | 359,012 | 1,112,875 | 377,037 | 46.2 incr. |
| Other kinds | 125 | 264 | 2,357 | 1,048 | 1785.6 incr. |
| **Meat Preparations** | | | | | |
| Sausages, all kinds | 137,337 | 96,598 | 160,871 | 112,564 | 17.2 incr. |
| Other kinds (including meat paste) | 474,571 | 301,843 | 577,895 | 360,519 | 21.8 incr. |
| Total | 3,386,690 | 1,713,672 | 3,739,504 | 1,748,054 | 10.4 incr. |

## FISHERIES

### Conditions

(a) Marine

82. Fishing on the broad shallow mud flats and further seawards provided the majority of fresh fish for local consumption. New fishing areas suitable for trawling were discovered. The deep sea fishing carried out by four trawlers and hand-lining is mainly for snapper, grouper, sea trout and croaker. The inshore fishing provides a great variety of fish including the queriman, catfish, snook, bashaw, shrimp, crabs, etc. Pin seines and to a lesser extent cadell and hand-lines are employed. The Chinese seine is the principal method of capturing estuarine fish. Fish fences and weirs have been recently introduced with some success.

83. The B.G. Fisheries and Trading Company commenced trawling operations offshore with 4 trawlers. The Company has installed refrigeration and ice making equipment on their premises and has found a ready local market for their fish.

(b) Inland

84. The principal fishing areas are inland waterways, reservoirs, swamps, fish ponds on farms and sugar-cane flood fallow fields. The principal fishing methods are the cast-net, gill-net, fence stop-off and various types of seines operated by whole and part-time fishermen. It is extremely difficult to estimate the production of fish from the quite considerable area of fresh water available, as a large proportion of the fish caught are used immediately for domestic consumption. In many areas, fresh water fish are a more regular item in the diet than sea fish. Subsistence fisherwomen operating dip nets or lift baskets are a common sight in most country districts. The Department has sponsored the establishment of some 280 fish ponds, of which 110 were built during the year, varying in size from 150 square yards to 5 acres for Tilapia mossambica which is a quick growing, introduced fish. Over 40,000 Tilapia fingerlings have been distributed from the Department's hatchery.

### Production

85. There were 993 registered owners of fishing boats engaged in coastal, estuarine and deep sea fishing, compared with 981 in 1955. The number of boats with outboard engines increased from 176 in 1955 to 179 in 1956. There was no increase in the number of inboard engines. The boats varied in size from 18 feet to 50 feet. There were 12 boats (70 - 90 foot schooners) engaged in deep sea fishing compared with 11 in 1955. Four trawlers owned by the B.G. Fisheries and Trading Company also went into operation.

86. Fish landed in Georgetown from coastal and estuarine sources amounted to 7,402,232 lb., having an estimated wholesale value at 35 cents per lb. of $2,590,781.20 compared with 7,464,750 lb. valued at 30 cents per lb. of $2,339,425 in 1955. Deep sea landings from trawlers amounted to 100,000 lb. valued at $32,000 and from other deep sea boats 599,906 lb. valued at $235,907.63. The total landings by deep sea boats, including trawlers, therefore rose by 119,906 lb. to 699,906 lb. in 1956 valued at $267,907.63 compared with 1955. The production of shrimp meal fell to 43,000 lb.

87. Imports of fish and fish preparations compared with 1955 fell in quantity, but not in value, by 298,787 lb. to 5,753,187 lb. valued at $1,913,146.

## SECTION II

## WORK OF THE DEPARTMENT

### A. THE EXTENSION SERVICES

88. The staff situation was fairly satisfactory. Seven Instructors returned from the Eastern Caribbean Farm Institute and filled gaps which had been existing for a number of years. Contacts between the extension service and the farming community continued to increased steadily.

EXTENSION METHODS

89. The methods used to contact farmers were essentially those used in most Extension Services. These may be classified as: Individual Methods, Group Methods and Mass Methods.

Individual Methods

(a) Farm Visits

90. By far the most important and effective technique, the field officer meets the farmer 'face to face' on his own farm and advises him on some improvement, invariably giving actual demonstrations himself, e.g. pruning an orchard, controlling insect pests and the proper management of livestock; or the officer may offer the farmer at cost price (from stocks carried by him or available at his office), a new variety of seed, fertilizers, insecticides, veterinary drugs and literature, e.g. the Departmental leaflets and bulletins; or he may perform some service free of cost, e.g. treating a sick animal, castrating a bull, deworming a calf.

91. Farm visits were made also for investigating applications for loans, supervising the use of loans, enquiring into applications for duty-free petrol for use in agricultural machinery, securing information in connection with economic studies and enquiries from the Central Government. The field officer's visit to a farmer is associated therefore, more often than not, with some actual benefit to the farmer, either directly or indirectly.

92. During the year, the staff reported a total of 28,353 visits to farms compared with 25,228 in 1955. These were distributed as follows:-

| | | |
|---|---|---|
| Berbice | - | 5,512 |
| Demerara | - | 12,370 |
| Essequibo | - | 8,793 |
| North West District | - | 1,678 |

(b) Interviews

93. The farmer often visits the Agricultural Officer at his home, office or Demonstration Station in search of advice and information. A total of 29,447 such interviews were recorded as follows, compared with 23,984 in 1955:-

| | | |
|---|---|---|
| Berbice | - | 3,932 |
| Demerara | - | 19,524 |
| Essequibo | - | 5,415 |
| North West District | - | 576 |

(c) Telephone Calls and Letters

94. No record was kept of these. However, it should be stressed that a great deal of information passes between officers and farmers through these media.

Group Methods

95. Since the extension worker recognises that his effectiveness is greatly limited if confined to personal contacts with farm people, he tends to work increasingly through groups of rural people. This is particularly important in British Guiana, where there are in all a total of only 36 Extension Officers to cater for a rural population of over 300,000.

(a) Meetings

96. A total of 956 meetings was called or attended by the staff, compared with 636 in 1955, to discuss agricultural topics, to introduce new ideas and to organise self-help and co-operative schemes. These included meetings of Regional Development Committees and Area Sub-Committees.

(b) Field Days

97. These were designed for the purpose of method and result demonstrations and were most popular with farmers. Some were arranged also for school children. The locus of the Field Day was usually the Demonstration Station or Experimental Farm. The cost of lunches and of travelling expenses was met from Departmental funds. A total of 13 Field Days was held, compared with 6 in 1955.

(c) Training Courses

98. Local training courses for farmers were held in Plant Propagation, Beekeeping, Fishery, Dairy Husbandry, Pig Rearing and Poultry Management. Fifty farmers attended from the various districts. In addition, 2 farm youths left for the United States of America to under go "on-the-farm training" under the Young Farmer Training Programme of the International Co-operation Administration.

(d) Agricultural Apprenticeship Scheme

99. The Department continued the two-year Agricultural Apprenticeship Scheme. Four apprentices completed their training and 5 new entrants were admitted.

Mass Methods

(a) Departmental Publications

100. The Farm Journal was discontinued. To take its place it was decided to issue leaflets and bulletins on topical subjects to reach specific sections of the farming community. Nine leaflets and bulletins were issued during the year.

(b) Government Information Services' Bulletins and the Daily Newspapers

101. Very close and valuable co-operation was maintained with the Government Information Services and, through that Department, with the Daily Newspapers; Press Conferences attended by the Director, Departmental Officers and visiting experts were arranged. Full publicity was given to projects and even to educational material.

102. The newspapers co-operated by giving full 'coverage' to Field Days, Competitions and other efforts, and by publishing weekly a review of agricultural prices compiled by the Extension Service.

(c) Radio

103. The fifteen-minute weekly radio programme started late in 1955, became a regularly established feature in 1956. It covered a wide range of subjects of agricultural interest and included talks by officers and interviews with farmers.

(d) Agricultural Shows and Exhibitions

104. The Department contributed exhibits of its work to the League of Coloured Peoples and the Indian Education Trust Exhibitions in Georgetown. Similar contributions were made to exhibitions arranged by the Community Development Committees at Golden Grove and Crabwood Creek, and also exhibitions sponsored by the Local Authorities of Essequibo Islands, East Demerara and West Demerara. Financial aid was given to the latter exhibitions, as well as assistance from Departmental Officers with regard to the organisation and judging of farm products.

(e) Competitions

105. The Department sponsored a Colony-wide Livestock Competition to stimulate interest in improved husbandry and breeding. Prizes in cash and kind were offered for calves, heifers, pigs and poultry. The response was satisfactory.

106. Three Kitchen Garden Competitions were also held in East Demerara, in which great interest was shown and several kitchen gardeners took part.

Other Media

107. The British Council provided film shows in the country on several agricultural subjects, by arrangement with District Officers and farm groups. Several films were also provided on loan by the United States Information Service.

Sales of Agricultural Requisites

108. The extension staff introduced to farmers various farm requisites, such as imported vegetable seeds, fertilizers, veterinary drugs and stock feeds. Stocks were kept at their offices and at District Demonstration Stations and many items were taken to farmers by Instructors in their knapsacks. Moreover, the Marketing Division from which these goods were obtained, made direct sales in Georgetown and New Amsterdam and in the country via mail orders. Once the farmer was satisfied with their value, he frequently made his own arrangements for securing further supplies through normal commercial channels.

Pure Line Seed Padi

109. The staff were responsible for the sale to farmers of pure line seed padi produced under supervision of the Department on the Government Land Settlement Schemes at Anna Regina and Cane Grove.

110. The varieties distributed were No. 79, D.110, 85/42 and 52/37, and total sales were as follows compared with total sales in 1955.

TABLE X

| County | 1955 | | 1956 | | % Increase or Decrease |
|---|---|---|---|---|---|
| | Bags of 140 lb. net | Value $ | Bags of 140 lb. net | Value $ | |
| Berbice | 520 | 4,026.88 | 1,387 | 10,045.06 | 166.7 Incr. |
| Demerara | 3,179 | 27,744.16 | 4,265 | 35,786.01 | 34.2 Incr. |
| Essequibo | 1,832 | 14,220.64 | 6,602 | 38,470.71 | 260.4 Incr. |
| Total | 5,531 | 45,991.68 | 12,254 | 84,301.78 | 121.6 Incr. |

111. In addition, farmers were encouraged to produce their own seed padi under a scheme operated in collaboration with the Rice Producers' Association. The following quantities were produced, bought subsequently by the Department and finally resold to farmers. The response was not as good as in the previous year as is illustrated in Table XI of sales below.

TABLE XI

| County | 1955 | | 1956 | | % Increase or Decrease |
|---|---|---|---|---|---|
| | Bags of 140 lb. net | Value $ | Bags of 140 lb. net | Value $ | |
| Berbice | 123 | 824.90 | 69 | 414.00 | 48.8 Decr. |
| Demerara | 388 | 2,923.27 | 270 | 2,254.52 | 30.4 Decr. |
| Essequibo | 155 | 985.70 | - | - | 100.0 Decr. |
| Total | 666 | 4,733.87 | 339 | 2,668.52 | 49.1 Decr. |

112. Pure-bred poultry and livestock produced at the Departmental Farm in Georgetown were distributed through the Extension staff. Other supplies sold included economic plants, notably budded citrus and clonal cacao plants.

Co-operation with Government Departments and other Agencies

Regional Development Committees

113. A great deal of time was spent by officers in connection with the operations of the Regional Development Committees and their Area Sub-Committees. The staff attended many meetings, investigated applications for loans and assisted in the preparation of community development and self-help schemes. It was estimated that at least a third of the time available to officers for official duty was spent in one way or another on the business of these Committees.

The Credit Corporation

114. Much of the work done by Regional Development Committees was connected with the activities of the Credit Corporation. The staff gave special attention to applications for large loans, referred direct by the Credit Corporation for examination and advice. A total of 1,396 loans for $912,381 was issued to farmers by the Credit Corporation as well as food production loans issued to 120 Societies for $373,789.

Machinery Hire Pools

115. Agricultural Superintendents served as Members of Area Committees concerned with the operation of the Machinery Hire Pools. The equipment of these pools, comprising bulldozers and draglines, were used on hire for clearing and draining new lands and reconditioning derelict estates. The main functions of the Committees were to determine priorities in view of the large number of requests from farmers and to settle disputes arising from the nature and quality of work done.

Inspection for duty-free petrol

116. The staff continued to be responsible for examining applications by farmers for 'duty-free' petrol for use in Agriculture. The quantity of petrol issued free of duty amounted to 542,384 gallons, an increase of 250,113 gallons (85.6%) on the previous year, see Table XII hereunder.

TABLE XII

| | 1955 | 1956 | % Increase or Decrease |
|---|---|---|---|
| Rice | 170,958 glns. | 402,185 glns. | 146.3 Incr. |
| Sugar | 114,811 "* | 129,804 "* | 13.1 Incr. |
| Ranching | 3,328 " | 3,780 " | 13.6 Incr. |
| Other | 3,174 " | 6,615 " | 108.4 Incr. |
| Total | 292,271 glns. | 542,384 glns. | 85.6 Incr. |

* Issued direct to sugar plantation on the drawback system.

Land Settlement Schemes

117. The Department of Land Settlement is responsible for establishing and managing Land Settlements in the Colony. Schemes in operation comprised 23,421 acres, all of which are operated on the Land Lord/Tenant system. These estates are situated on the coastal belt and comprise Cane Grove - La Bonne Mere (7,233 acres) Windsor Forest - La Jalousie (3,846 acres), Vergenoegen cum annexis (3,595 acres) and Anna Regina cum annexis (8,747 acres). There are also a small semi-residential estate at Charity - Amazon and a Land Lease Scheme at Onverwagt.

118. The usual pattern of settlement is the allocation of 10 acres of land to each settler for rice cultivation. Tenancy is annual but is secure provided the settler practises the rules of good husbandry. The estates do not recover their full costs of operation. Tenants are, therefore, heavily subsidised. Smaller plots are also rented to settlers

for provisions and dairy farming in addition to the land allocated for rice. A coconut orchard is maintained at La Bonne Mere by the Land Settlement Department itself - this is the only example of direct farming by the Department on any of its Schemes.

119. The relationship which exists between the Department of Agriculture and the Land Settlement Department is one of closest collaboration. The Land Settlement Department is responsible for promoting, developing and managing Land Settlements, while the Department of Agriculture is concerned with formulating their agricultural policy and with promoting improved practices among the settlers. The entire technical resources of the Department of Agriculture are available to the Land Settlement Department. Soil Surveys, control of pests and diseases, agricultural economic investigations, veterinary and animal husbandry services, agricultural education and training, general advice by Agricultural Officers, are examples of the services which are offered by the Department of Agriculture to the Land Settlement Department. This arrangement ensures continuity of agricultural policy when Land Settlements are sufficiently developed to be converted into managerially autonomous Local Authorities, at which stage the personnel and equipment of the Land Settlement Department will be withdrawn and transferred to new areas of development, while the Department of Agriculture will remain to provide services to the tenants in their new role as villagers.

120. Collaboration between these two Departments was emphasized during the year by the creation of a new post in the Department of Agriculture, designated Deputy Director of Agriculture (Land Settlement and Marketing), some of the duties of which require the holder to co-ordinate and supervise the services of the Department of Agriculture on Land Settlements and to act as chief liaison officer between the two Departments.

121. During the year, the Deputy Director of Agriculture (Land Settlement and Marketing) carried out a survey of all Schemes in order to assess the need and means for improving their productivity. He submitted his report at year end.

122. A large number of visits were paid to these Schemes by Agricultural Instructors, Veterinary Officers, specialists and others. Experiments were conducted on the effect of fertilizers on rice, and on the cultivation of cotton and of cacao. There was also a trial on the response of native pasturage to phosphatic fertilizers.

123. The success of fertilizer trials on rice grown on soils showing aluminium toxicity resulted in the Land Settlement Department supplying fertilizers on credit to farmers. Yield increases were as much as 4 times more than on unfertilized ground.

124. The cotton trials are reported elsewhere in this report. They showed that certain varieties of cotton can be grown successfully on suitable soil, but that high labour costs in relation to the value of the yield might dissuade the small farmer from growing the crop. Moreover, pegassy soils and soils with a high water table (which are the major categories found on these schemes), are unsuitable.

125. Considerable time was spent in planning the new Schemes of Mara and Garden of Eden. Soils surveys were carried out at Garden of Eden and part of Mara.

Extensive reconnaissance soil surveys were conducted also in the Boerasirie and in the Black Bush Polder - two new areas of proposed settlement involving some 50,000 acres.

126. Production of citrus and cacao clones was expanded in this Department's nurseries to meet the demand which is expected from Garden of Eden.

127. The year was a disappointing one for livestock production. Despite the availability of the Artificial Insemination Service, balanced rations, veterinary assistance and advice on husbandry and cultivation of grasses, the dairy cattle showed little improvement. Many settlers do not seem to have a genuine interest in dairying and most do not have the money needed to finance their operations. Recommendations for remedying this situation are being considered.

128. Pure line seed padi is grown by tenants on 2 Land Settlements under supervision and is distributed to farmers throughout the Colony. This activity gives the farmer a higher price for his crop (about $20 per acre more) and serves to demonstrate better cultural practices both to the grower and his neighbours. During the year 12,254 bags valued $94,968.50 to the farmer, produced in the 1955 crop year, were sold.

Drainage and Irrigation Department

Crop Valuation

129. The work of crop valuation in the Boerasirie Extension Project continued under the crop valuator, whose valuations were used by the Drainage and Irrigation Department for the award of compensation to farmers. Numerous ad hoc enquiries from other Departments for valuation of crops were dealt with by the staff.

Local Authorities

130. The staff maintained the usual close contact with Local Authorities. Officers and Instructors attended meetings and reported on agricultural conditions, gave talks on measures for improving agriculture and advertised new Departmental projects. Local Authorities permitted Instructors to use their offices for interviewing farmers and cooperated in supplying data for agricultural surveys and censuses.

131. Special assistance was given to Community Projects initiated in East Demerara and Berbice in the two villages of Golden Grove-Nabaclis and Crabwood Creek.

The Peasant Sugar-cane Farming Industry

132. An Agricultural Instructor continued to be specially assigned to the peasant sugar-cane farming industry on the East Coast of Demerara. Due to restrictions in the world market, there was no increase in acreage which remained at 1,689 acres. 2,878 tons of sugar, valued at $317,038, were produced compared with 2,800 tons of sugar, valued at $307,586, in 1955.

133. The Extension programme was directed towards encouraging block-planting, block-harvesting, delivery of clean canes to the mills, controlling the frog-hopper pest, distribution of planting material of high yielding varieties resistant to Leaf Scald disease, flood fallowing of fields, application of fertilizers and improving field practices.

Pests

134. Froghopper attacks were serious in 2 areas. Improvement in drainage has been undertaken to help control this pest. Dusting with agrocide was carried out on a small scale. The fund to which farmers contributed 2 cents per ton cane for the purpose of buying agrocide reached a total of $1,254.14.

Distribution of Planting Material

135. There was no shortage of planting material. 15½ tons of planting material, valued at $190.35, were bought from estates.

Fertilizers

136. There was an increase in the use of artificial fertilizers, 2,333 bags valued $32,432 being used, compared with 2,101 bags valued $28,065 in 1955.

Flood Fallow

137. Renewed interest was taken in flood fallowing. A pump was borrowed from the estates to assist farmers who gave signed guarantees for payment of the cost of hire. 58 acres were flood fallowed compared with 4½ acres in 1955.

Improving Standards of Cultivation

138. The more important method used to educate farmers in improving their system of cultivation was advice on the spot by the Instructor. In addition, a competition was held between villages for the highest general standard of efficiency; Plaisance succeeded in winning the Malcolm Laing Cup for the fourth year in succession.

Work of Committees

139. The Price-fixing Committee for farmers' canes continued to function. The Agricultural Chemist, the Chairman, made periodic tests of samples of juice taken by him at factories. Prices fixed by the Committee ranged from $9.74 per ton to $9.26.

140. The Central Cane Farmers' Committee met on several occasions and considered a wide range of matters affecting the Industry. The Agricultural Superintendent and Cane Farming Officer worked closely with this Committee.

Cane Farmers' Pilot Scheme

141. Messrs. Bookers Sugar Estates Ltd. commenced a Cane Farmers' Pilot Scheme at Wales Estate during the year. 32 farmers were enrolled by the close of the year out of an intended 57.

BEEKEEPING

142. The Beekeeping Division maintained its services to the 210 beekeepers operating in British Guiana and 443 visits were made. Many demonstrations and talks were given and exhibits put up at 8 exhibitions.

143. The Botanical Gardens' apiary was maintained for the production of queen bees and nucleus hives. 140 queens were bred and sold or distributed as well as 51 hives.

144. The Department continued to give active support to the B.G. Beekeepers' Association in which 57 financial members were enrolled. The Association assisted members by buying and reselling labels and equipment. Members continued to receive 10% discount on purchases of beekeeping equipment.

## AGRICULTURAL EDUCATION AND INFORMATION

145. This division acquired its full complement of staff during the year. It was organised into the following working sections: library, radio, publications, photography, draughting, and school gardens. Various courses of training were undertaken for the new staff recruited and, by the end of the year, the division was working as a fully established unit of the Department.

### School Gardens

146. Work in school gardens was mainly directed towards maintenance of standards and the continuation of projects started in previous years. Maintenance grants were made to 58 schools, and special grants for building fences and purchasing tools to 28 schools.

147. School Gardening Competitions were held in the 5 main districts: Essequibo Coast, Essequibo Islands, West Demerara, East Demerara and the Upper Corentyne. The schools competed for individual prizes on a district basis and for the Bannister Shield on a Colony basis. School gardening certificates were also awarded on a year-round assessment.

148. Two Field Days for school children were held at 2 school gardens. The teachers themselves requested that the Field Day should be held at a school instead of on a Departmental station. Demonstrations were given by the school children themselves under the guidance of their gardening teachers.

149. Fish culture, beekeeping and poultry rearing were other projects established in some of the more interested schools.

### Training of Teachers

150. First and Second Year male students of the Government Training College received weekly lectures from the Agricultural Superintendent (Education).

### Radio

151. The fifteen-minute farm radio programme produced in co-operation with the Government Information Services was continued throughout the year. It dealt with a wide range of subjects concerning crops, livestock, veterinary diseases, plant pests and diseases, etc.

### Publications

152. Nine publications were produced as follows:-

1. "Use Germinated Padi"
2. "Fertilizing Padi"
3. "Rabies and its Control"
4. "Prevent Coconut Caterpillar Outbreaks"

5. "Food Makes a Difference"
6. "Rations for all types of Pigs"
7. "Selection and Management of Swine Breeding Stock"
8. "The Deep Litter System of Poultry Management"
9. "Agriculture In British Guiana"

Audio-visual Aids

153. An I.C.A. Visual Aids team visited the Colony and conducted a one-week course of detailed work and discussion. The course was attended by staff of the Department of Agriculture and representatives from other Government Departments.

154. Peg boards for general use were built for distribution to the Extension staff. A silk-screen table was built and materials for making silk screens were obtained from the United States of America. The Photography section of the division assisted Specialist and Extension Divisions by processing prints needed for reports.

Field Information Projects

155. Special Field Information Projects were started by the I.C.A. Agriculture Information Specialist as follows:-

| | | |
|---|---|---|
| 1. Berbice | - | (a) Care and management of baby chicks and pigs. |
| 2. East Demerara | - | (a) Artificial Insemination.<br>(b) Coconut Caterpillar. |
| 3. East Bank Demerara | - | (a) Deep Litter System of Poultry rearing. |
| 4. Essequibo | - | (a) Artificial Insemination. |
| 5. North West District | - | (a) Legume cover crops. |

RURAL YOUTH TRAINING

156. Considerable progress was made in organising and staffing this division, all but one staff vacancy having been filled by the end of the year. Invaluable assistance in all aspects of this work was rendered by the International Co-operation Administration's Rural Youth Specialist attached to this division. It should be recorded that, without this Specialist's knowledge and enthusiasm, the considerable progress made could not have been achieved.

157. Five Rural Youth Instructors were recruited and, after training in the work of the Department, were posted to districts. Two Training Courses were held for these Instructors and the Extension staff of the Department. Community surveys were conducted by the Instructors as a result of which 24 4-H and Young Farmers' Clubs, with a membership of 1,338, were established. Five Leaders' Training Meetings were held at which 146 Leaders attended and received instructions on various phases of youth work. Six Parents' Meetings were conducted with a view to obtaining parents' co-operation.

158. Simple, mimeographed leaflets, 53 in Home Economics subjects and 17 in Agriculture, were prepared to provide basic information on project subjects such as gardening, beekeeping, livestock rearing, orchard crop management, food

and nutrition, home making. With this basic information available to club members, it was possible to organise project work for members; this is one of the basic principles of 4-H and Young Farmers' Club work and aims at improving skills and techniques to enable a better job to be done in agriculture and home making. Additional publications were a basic nutrition guide; a recipe book is also in course of preparation.

159. Members gave demonstrations and prepared exhibits for 10 exhibitions held in various districts. A very good community and team spirit exists within and between club groups. The membership of 4-H and Young Farmers' Clubs is recorded in Table XIII below.

TABLE XIII

| District | No. 4-H Clubs | Membership | | No. Local Leaders for 4-H Clubs | | No. Y. F. Clubs | Membership | |
|---|---|---|---|---|---|---|---|---|
| | | Boys | Girls | Men | Women | | Y. Men | Y. Women |
| Demerara | 9 | 166 | 371 | 11 | 24 | 1 | 13 | 2 |
| Essequibo | 4 | 113 | 175 | 6 | 8 | 2 | 36 | 51 |
| Berbice | 3 | 98 | 136 | 7 | 16 | 3 | 71 | 54 |
| Bartica | 2 | 32 | 20 | 1 | 1 | - | - | - |
| Total | 18 | 409 | 702 | 25 | 49 | 6 | 120 | 107 |

160. The project work of club members can be classified into 4 sub-divisions:-

(a) Agricultural projects concerned with poultry, vegetable garden, dairying, the rearing of goats, sheep and pigs, citrus and coffee growing and the keeping of bees. The most popular project work is that with poultry, followed by vegetable gardening, the rearing of pigs and dairying.

(b) Food and Nutrition projects in which the food value of the common foods is taught together with methods of preparation and cooking.

(c) Clothing projects where members are taught to design and make items for the home as well as wearing apparel. 471 members actively engaged in this type of project made 1,254 articles during the year and 37 members exhibited their work at exhibitions.

(d) Home Improvement projects where members make articles for the home both for utilitarian and beautification purposes. 184 projects were undertaken and 296 articles were made.

AGRICULTURAL DEMONSTRATION STATIONS AND STUD UNITS

161. Agricultural Demonstration Stations and stud units were maintained and supervised by senior Extension Officers in the larger districts as an integral part of the Agricultural Extension Programme. The main functions of these stations were to provide farmers with some or all of the following facilities:-

(a) A depot for the sale of certain agricultural and veterinary supplies.

(b) Seed multiplication and distribution.

(c) Observation and demonstration of new varieties and methods.

(d) Stud unit for improving the breed of livestock.

(e) A meeting place and advisory centre.

162. Farmers continued to take full advantage of these services. The following is an account of the work done on these stations.

Demerara - Paradise Station

163. Demonstration plots of suitable fodder grasses, vegetables and legumes were maintained and planting material was distributed free to farmers in the following amounts: 265 lb. seed, 3,361 plants, 5,882 slips and 200 lb. of grass cuttings. These included peas and beans, cucumber, egg plant, okra, tomato, onions, mint, thyme, sweet potatoes, fodder grasses and legumes.

164. A Kentucky jack donkey was maintained for service to mares, but performed only 4 services compared with 9 in 1955. Dairy cows were kept for the purpose of demonstrating good husbandry and the soiling system. A total of 11,154 pints of milk was sold compared with 4,818 pints in 1955. Cockerels were reared on the station for exchange, 62 being exchanged.

Berbice - No. 63 and Whim Stations

165. Apart from their demonstration value, these stations have served as the main sources of planting material of certain crops for distribution to farmers in the county. Thus, No. 63 was the principal supplier of citrus plants whereas Whim supplied grasses and fodder plants.

166. The following table shows the quantities of planting material sold from the 2 stations and the New Amsterdam office:-

| | 1955 | 1956 |
|---|---|---|
| Vegetable seeds | 3,721 pkts. | 4,826 pkts. |
| Citrus plants | 1,221 plants | 1,195 plants |
| Coconut plants | 526 " | 40 " |
| Vegetable seedlings | 2,383 " | |

167. In addition, seed of the following vegetables was distributed free: bora, sinebone, bonavist, butter and lima beans, black-eye, urid, mung, pigeon peas, egg plant, shallots, Indian kale, sweet potato and cuttings, poi spinach, okra and squash.

168. The following studs were kept at the stations: 1 boar and 1 bull at No. 63; 2 boars, 1 bull, 1 Kentucky jack and 1 ram at Whim. Response by farmers was disappointing. The boars did 9 services, the bulls 18, the jack 3 and the ram 2.

169. Two cows were maintained at Whim to demonstrate the soiling system and improved methods of husbandry. Milk yield was 6,642 pints compared with 4,721½ pints in 1955.

Essequibo - Suddie, Maria's Lodge, Charity and La Belle Alliance

170. The Suddie and Maria's Lodge citrus nurseries distributed 1,325 and 2,347 budded plants respectively during the year. The Charity nursery distributed 973 coffee seedlings; at the end of the year this nursery suffered a severe loss of about 4,000 coffee seedlings on account of floods.

171. At La Belle Alliance a new cacao propagating unit was established. The construction of a hardening floor and storage shed, 2 propagating bins and 2 hardening bins was completed and 3½ acres of nursery planted with shade.

172. The vegetable demonstration plot was transferred from Suddie to Maria's Lodge. 767½ lb. of vegetables (tomatoes, peppers, mustard, beans, etc.) were sold to the Public Hospital during the year.

Mazaruni-Potaro

173. The citrus plot was maintained during the year and produced 10,184 oranges and grapefruit. A slight decline in vigour was observed among twelve-year old trees. The cultivation of citrus continued to spread in the area and 371 budded citrus plants were sold from the station.

174. A small flock of poultry was maintained on the open range system in the citrus orchard for demonstration purposes. 1,362 eggs were produced. Poultry rearing has become an important minor industry in the district.

175. Five cows were kept to demonstrate good husbandry and the soiling system. 13,122 pints of milk were produced. Interest in dairying has increased considerably in this district and many farmers have purchased cows from the Penal Settlement nearby which sold out a large proportion of its herd during the year.

176. Work at this station has shown that citrus with poultry and intensive dairying are the answers to the agricultural needs of the district. This system has become the accepted pattern for development.

North West District - Hosororo Agricultural Station

177. This is the largest station attached to the Extension Service and its activities were maintained and intensified. The programme of work included general maintenance work, field trials, investigations with crops and livestock, production of breeding stock and planting material, Field Days and demonstrations.

Citrus

178. There was a marked improvement in the condition of the citrus fields as a result of the extensive pruning done in the previous year. Farmers were impressed with the rehabilitation which has been effected in one of the oldest, if not the oldest, orchard in the country. 328 budded citrus plants were sold to farmers and 5,121 citrus fruits to the Marketing Division.

Cacao

179. The cacao trial plots on the hill slopes were well maintained and their flourishing condition continued

to impress all visitors to the station. The trees, although young, bore exceedingly good crops, and 1,157 lb. of beans were marketed compared with 279 lb. in 1955.

180. The old propagating unit was dismantled and a new permanent glasshouse built, together with propagating and hardening bins. A new nursery of 5 acres was cleared and prepared for planting with ICS clones. 734 clonal plants were propagated, of which 168 were distributed to farmers.

Coffee

181. The 2 plots of Liberica and Robusta coffee did not do well under the wet conditions of the low-lying swampy section. It has been decided to put in more drains between the rows to see if this would bring about any improvement. Flowering of the Robusta commenced at year end.

Avacado Pear

182. Both the old and new fields of avacado showed good progress during the year.

Coconut

183. Maintenance of this plot, consisting of the St. Lucia dwarf and the local tall varieties, continued.

Cashew

184. The cashew trees kept in excellent condition; a crop was being borne at year end.

Cotton

185. One observation plot was reaped in March and another was planted in November for further information.

Castor Bean

186. The trial in the low-lying swampy section failed.

Grasses

187. The Locuntu and Wynne grasses planted in the citrus orchards and the Guatemala and Para grasses in the swamp made good progress.

Economic Nurseries

188. Propagation and distribution of planting material continued. The nursery on the swamp proved satisfactory. The increased demand for planting material was fully satisfied. Chiefly distributed were citrus, cashew, cacao, avocado, nutmeg, black-pepper, castor bean, plantain and banana suckers, cassava, vegetable seeds, seedlings and cuttings.

189. In addition to the regular sale of plants, there was some free distribution. Farmers, Government compounds, Indian Settlements, Missions, all benefited from gifts of plants, seeds, suckers, cassava sticks, budwood, etc.

190. Another function of the nurseries was the collection and distribution of seeds, seedlings, budwood, fern roots, moss, etc. to other divisions and districts.

Vegetable Garden

191. The demonstration vegetable garden was maintained throughout the year. Chiefly grown were peas and beans and the hardier leaf and fruit vegetables.

Pegasse Trials

192. Trials on the worn out pegasse soils in the swamp area consisted of 2 grass experiments, corn and rice fertilizer trials, and observation plots of turmeric and ginger.

Cattle

193. A herd of 1 breeding bull and 5 cows was maintained. Six calves were born during the year, 3 of which were sold to local farmers.

194. The cattle were used for demonstration and breeding purposes. They utilised un-marketable produce, supplied manure and permitted observations on types suited to the district. The demonstration value of these animals has been substantial in the North West District where cattle are scarce.

Donkey

195. This animal maintained excellent condition. His use as a pack animal served as an incentive to hill farmers, one of whose difficulties has always been transportation.

Sheep

196. A flock of 1 ram and 7 ewes was maintained. Seven lambs were born during the year. Condition of the animals was fair throughout the year.

Turkeys

197. These were sold out at the end of the year. They will not be replaced as there is no demand for these birds.

Chickens

198. Pens of Rhode Island Red and of Barred Plymouth Rock were maintained for demonstration purposes and the production of eggs for hatching. The birds showed excellent health and condition and produced well. Their care, housing, paddocking and production provided demonstration material. It is pleasing to note that more farmers have adopted some of the practices in vogue on the station. 3,643 eggs were produced compared with 1,303 eggs in 1955.

## B. RESEARCH AND EXPERIMENTATION

### (i) Financed from Local Funds

199. Agricultural Research in the Colony is carried out by the specialist and other officers of the Department of Agriculture, the Sugar Experiment Station staff and Bookers Sugar Estates Ltd. The B.G. Rice Development Company continued to work on problems in connection with all aspects of the mechanisation of rice cultivation, and the Berbice Fibre Research Company continued its efforts to determine whether jute could be produced economically under local conditions.

#### SUGAR-CANE

#### General

200. The research work of the Sugar Experiment Station is fully reported each year in the Annual Sugar Bulletin. The main line of work is varietal testing, but cultivation and fertilizer experiments are also carried out. In addition to the work of the Sugar Station, Bookers Sugar Estates Ltd. have set up their own research organisation. The work of this organisation is generally made available to the industry through the Sugar-Cane Research Sub-Committee and, on a wider scale, at West Indian Sugar Conferences.

#### Variety Testing

201. The 1956 variety trials have continued to show that the present major standard, B.41227, is a difficult cane to surpass owing to its good average all-round performance. However, B.47258 and B.49119 are likely to prove close rivals, particularly B.47258, which has done sufficiently well in tests to justify its further extension on a commercial scale. This variety is not only an attractive cane but possesses a Pol. % cane that is above average for British Guiana. Up to the present, it has shown itself to be a satisfactory ratooner and has the great advantage over the present standards of being tolerant to Leaf Scald disease.

202. B.49119 has performed reasonably satisfactorily as a plant cane but it is as a ratooner that it has so far shown to best advantage. Unfortunately, this promising variety is rated as susceptible to Leaf Scald disease. It is also not as attravtive as B.47258, the stalks tending to be below average diameter, particularly as ratoons.

203. Amongst other canes under test, it is believed that B.45137, B.43413 and D.37/45 have a place in commercial cultivation. B.45137 is a hardy cane which ratoons strongly but unfortunately possesses a Pol. % cane below average for British Guiana. B.43413 has been a fairly consistent performer compared with B.41227 and continues to be worthy of trial on a small scale on sugar estates.

204. D.37/45 has shown itself to be outstanding when reaped in September, October and November and is particularly suited to silty clays.

205. The performance of the more promising varieties under test is compared with B.41227 in Table XIV. The comparisons are on the basis of yields of available Pol. per acre relative to B.41227 which is rated at 100. Pol % cane ratings are similarly compared.

TABLE XIV

THE MORE OUTSTANDING VARIETIES COMPARED WITH B.41227

| Variety | No. of Comparisons | | | Available Pol. per acre Index (B.41227 = 100) | | | Tons available Pol. per acre (B.41227 = 100) | | | Available Pol. % cane Index (B.41227 = 100) |
|---|---|---|---|---|---|---|---|---|---|---|
| | P. | 1 R. | 2 R. | P. | 1 R. | 2 R. | P. | 1 R. | 2 R. | Mean All Cycles |
| D.62/43 | 16 | 16 | 16 | 108 | 109 | 103 | 6.60 | 5.52 | 4.57 | 100 |
| D.37/45 | 18 | 17 | 11 | 93 | 101 | 109 | 5.68 | 5.12 | 4.84 | 102 |
| B.47258 | 14 | 11 | 5 | 102 | 109 | 98 | 6.23 | 5.52 | 4.35 | 103 |
| B.45137 | 15 | 12 | 7 | 91 | 103 | 112 | 5.56 | 5.22 | 4.97 | 98 |
| B.41227 | - | - | - | 100 | 100 | 100 | 6.11 | 5.07 | 4.44 | 100 |
| B.43413 | 13 | 10 | 9 | 96 | 97 | 105 | 5.87 | 4.92 | 4.66 | 99 |
| B.37161 | 35 | 32 | 26 | 91 | 97 | 94 | 5.56 | 4.92 | 4.17 | 100 |
| B.47225 | 14 | 13 | 8 | 97 | 90 | 81 | 5.93 | 4.56 | 3.60 | 102 |
| D.158/41 | 10 | 10 | 9 | 96 | 89 | 96 | 5.87 | 4.51 | 4.26 | 95 |
| D.54/43 | 10 | 10 | 9 | 88 | 90 | 91 | 5.38 | 4.56 | 4.04 | 90 |
| D.4/43 | 13 | 10 | 10 | 90 | 94 | 92 | 5.50 | 4.77 | 4.08 | 96 |
| D.58/43 | 6 | 6 | 6 | 92 | 91 | 92 | 5.62 | 4.61 | 4.08 | 92 |
| B.46378 | 18 | 18 | 17 | 94 | 89 | 96 | 5.74 | 4.51 | 4.26 | 97 |
| B.4362 | 15 | 14 | 6 | 93 | 97 | 88 | 5.68 | 4.92 | 3.91 | 109 |
| B.4098 | 15 | 13 | 13 | 92 | 92 | 84 | 5.62 | 4.66 | 3.73 | 103 |
| B.34104 | 21 | 19 | 16 | 84 | 81 | 83 | 5.13 | 4.11 | 3.69 | 99 |
| B.43253 | 10 | 8 | 3 | 88 | 84 | 87 | 5.38 | 4.26 | 3.86 | 110 |
| B.46351 | 15 | 13 | 11 | 87 | 92 | 84 | 5.32 | 4.66 | 3.73 | 97 |
| B.4744 | 13 | 13 | 6 | 86 | 92 | 84 | 5.25 | 4.66 | 3.73 | 98 |
| B.47419 | 9 | 7 | 3 | 90 | 92 | 97 | 5.50 | 4.66 | 4.31 | 97 |
| B.47379 | 9 | 6 | 3 | 87 | 89 | 84 | 5.32 | 4.51 | 3.73 | 90 |

Growth and Ripening Studies

206. In general, the conclusions drawn from the plant cane results also apply to those obtained from the first ratoons. However, 2 aspects which call for further comment at this stage are, firstly, the 2 peaks which tend to be a feature of some of the yield curves, and secondly, the relationship between Pol. % cane and yield.

(a) Peaks on Yield Curves

207. When the data from these experiments are plotted in the form of yield curves, in many cases, 2 yield peaks occur over a fifteen-month period of growth. In the case of the arrowing varieties, the first peak usually occurs where these arrow at from 9 to 12 months of age and is usually followed by a fall in the yield curve, the degree of fall depending on climatic and varietal factors. In the case of B.37161 and D. 37/45 particularly, the fall in yield is usually appreciable where heavy rain immediately follows arrowing.

208. An arrowed stalk is no longer capable of further growth and when the first yield peak occurs at time of arrowing or just after, it represents the result of a high percentage of the primary stalks attaining maturity as is indicated by their arrowing. The subsequent decrease in yield which usually follows - particularly if heavy rains occur - is to be attributed to the stored sucrose of the matured stalks being used for the rapid growth of the immature ones at a greater speed than new sucrose is being synthesised and stored. Eventually however, the rate of synthesis and storage by the growing stalk population usually again overtakes the rate of consumption of sucrose from the matured stalks and the yield curve again rises. If growth conditions are favourable, the second yield peak may occur comparatively rapidly and represents the point of maturity of a majority of the secondary stalks.

209. The stalks of non-arrowing varieties, such as B.41227, (or of normally arrowing varieties which have not received the requisite combination of essential factors for arrows to be formed), also attain a point of physiological maturity. The behaviour of such stalks appears to be similar to that of arrowed stalks with corresponding effects in so far as the yield curve is concerned. In such cases, the first peak in the yield curve corresponds to the attainment of physiological maturity in a majority of the primary stalk population. The second peak in non-arrowing varieties would correspond to a similar state of affairs in the secondary stalk population.

210. It follows from the foregoing that the nature of the yield curve will depend not only on the climatic conditions and varietal factors controlling length of growth of individual stalks prior to these attaining maturity but also on the uniformity in the development and maturity of primary and secondary stalks.

(b) Relationship between Pol. % Cane and Yield

211. In the plant cane crop, there was a moderately satisfactory relationship between the Pol. % cane and the resulting yield of 96° sugar per acre. Such a relationship did not always hold in the case of the first ratoon crop

212. It appears from the results obtained to date from this series of experiments that the first yield peak can in most cases be determined from the Pol. % cane data, but the second peak of tons sugar per acre cannot be determined by this means. Under the climatic conditions that prevail in British Guiana, the desirability of awaiting a higher yield at the second yield peak will probably not be a sound economic proposition since there is usually a considerable fall in cane quality at this stage which would increase transportation and factory cost per ton of sugar while the time taken for the attainment of the second yield peak would reduce the rate of turnover of land. More data over a wider range of climatic and soil conditions on this and other aspects noted in the foregoing discussion are desirable however.

Insect Pests

213. The main pests of sugar were Froghopper, Aeneolamia flavilatera, and the Moth Borers. The former is regularly controlled on estates by dusting with Benzene hexachloride dusts while biological control of the Moth Borers operates effectively except in the case of Diatraea canella. The tachinid parasite, Palpozenillia palpalis, which was introduced in 1955 to control D. canella was unsuccessful.

RICE

Introduction and Breeding

214. The breeding programme continued during the spring and autumn crops. The most advanced generations were at F11 and the more promising hybrid material of the later generations was tested in lattice square experiments. Introduction of varieties from a wide range of other countries continued and varietal stocks maintained consist of 6 local varieties and 206 imported varieties. The hybrid selections being grown are the result of over 800 crosses made since the inception of the programme.

215. The primary objective is to produce high yielding varieties more suited to mechanised cultivation and harvesting. Selections are made for non-lodging and non-shattering qualities in addition to the general selection for high yield, vigour and suitable grain character. Selection is also made for varieties suited to transplanting and hand harvesting.

216. This work was carried out on the Central Agricultural Station with a total of 17,616 plots grown. Selection for yield was practised from the fourth generation. It was possible to carry out this selection following fundamental studies on the correlation obtained between tillers per plant, number of grains per tiller, etc. Lattice square plot trials is the means employed for studying yield in the later generations and the results of these replicated tests permit an increased rate of elimination of many unsatisfactory lines. Five such trials were carried out during the year. The local variety No. 79 is used as a standard in all experiments and yields significantly greater than the standard are being obtained. Families 19, 21, 86, 98, 115, 134, 137, 145 are among the most promising so far tested. The lattice square trials have been followed up by strip trials with and without application of sulphate of ammonia (21% N.) and yields between 5,000 and 6,000 lb. padi per acre are being obtained. Impure lines were used in these trials. However, the main differences in the later generations are grain characters. The response to fertilizer is very variable and needs further study.

The value of the pick-up reel on combines was fully demonstrated. Milling tests were carried out on the grain from the strip trials and, as expected, the breakage increased as the length/breadth grain ratio widened.

Experiment on "Japanese" method of cultivation

217. Following the 1955 experiments on this intensive method of cultivation involving raised fertilized nursery beds, careful control of spacing, fertilizing in the field and weed control, as compared with the similar local transplanting practice using a flooded nursery, a further experiment was laid down. Continuous irrigation was proved not to be a factor which adversely affects yields with the "Japanese" method but the use of a "Japonica" hybrid gave a significantly greater yield than the local "indica" variety No. 79. Yield was depressed by the application of fertilizer for reasons not known. Seedlings from the local flooded nursery gave better yields than the "Japanese" nursery seedlings thereby repeating the previous results.

Fertilizer Investigations on Rice

218. At the Cane Grove Land Settlement on soils high in aluminium and sulphate, a $3^3$ factorial (confounded) single replicate trial was reaped for the third consecutive year. In the previous years, phosphate was highly significant and, for the 1956 crop, the linear response to this element was significant at both the 5% and 1% levels. Nitrogen was also significant at the 5% level. This trial has indicated that, for toxic soils, the first application should be 1 cwt. triple superphosphate (45% w.s. $P_2O_5$) and $\frac{1}{2}$ cwt. sulphate of ammonia (21% N.) per acre. For subsequent crops, 1 cwt. of 10:20 NP mixture per acre is required. The yields in lb. per acre are given below:-

| | | | | | |
|---|---|---|---|---|---|
| $N_o$ | 1442 | $P_o$ | 1134 | $L_o$ | 1512 |
| $N_1$ | 1540 | $P_1$ | 1750 | $L_1$ | 1596 |
| $N_2$ | 1834 | $P_2$ | 1904 | $L_2$ | 1694 |

No lime has been applied since 1954 when 2 tons and 4 tons of limestone per acre were incorporated in the soil.

219. Two $3^3$ factorial trials were carried out, one at Cane Grove on toxic soils and the other at the Central Agricultural Station on fertile clay, to investigate the role of the calcium ions in the triple superphosphate and, at the same time, to determine whether ammonium chloride was superior to sulphate of ammonia, particularly on soils which are naturally high in water soluble sulphates. In these trials, phosphoric acid was applied instead of triple superphosphate. The yields in lb. per acre are shown below:-

Cane Grove

| | | | | | |
|---|---|---|---|---|---|
| $N_o$ | 1372 | $P_o$ | 1652 | $L_o$ | 1806 |
| $N_1$ | 1596 | $P_1$ | 1442 | $L_1$ | 1498 |
| $N_2$ | 1806 | $P_2$ | 1680 | $L_2$ | 1470 |

Central Agricultural Station

| | | | | | |
|---|---|---|---|---|---|
| $N_o$ | 4592 | $P_o$ | 4074 | $L_o$ | 4508 |
| $N_1$ | 4158 | $P_1$ | 4634 | $L_1$ | 4116 |
| $N_2$ | 4592 | $P_2$ | 4634 | $L_2$ | 4704 |

$N_1$ = ½ cwt. ammonium chloride (26% N.) per acre.

$N_2$ = ½cwt. sulphate of ammonia (21% N.) per acre.

$P_1$ = $H_3PO_4$ equivalent to ½ cwt. triple superphosphate (45% w.s. $P_2O_5$) per acre.

$P_2$ = $H_3PO_4$ equivalent to 1 cwt. triple superphosphate (45% w.s. $P_2O_5$) per acre.

$L_1$ = ½ ton limestone per acre.

$L_2$ = 1 ton limestone per acre.

220. The linear responses to N, P and L and the linear interactions for both experiments showed no significance. Considering that on toxic soils at Cane Grove phosphate had in previous years given a positive response, it would appear that the calcium ions in superphosphate might be filling an important role.

221. At the Vergenoegen Land Settlement Scheme, a $3^3$ factorial (confounded) single replicate trial was carried out on a settler's farm. This land had in previous years given unsatisfactory yields. The yields obtained are given below in lb. per acre.

| | | | | | |
|---|---|---|---|---|---|
| $N_0$ | 2142 | $P_0$ | 1722 | $L_0$ | 1848 |
| $N_1$ | 2128 | $P_1$ | 2254 | $L_1$ | 2184 |
| $N_2$ | 2142 | $P_2$ | 2408 | $L_2$ | 2352 |

$N_1$ = ½ cwt. ammonia chloride (26% N.) per acre.

$N_2$ = ½ cwt. sulphate of ammonia (21% N.) per acre.

$P_1$ = ½ cwt. triple superphosphate (45% w.s. $P_2O_5$) per acre.

$P_2$ = 1 cwt. triple superphosphate (45% w.s. $P_2O_5$) per acre.

$L_1$ = ½ ton limestone per acre.

$L_2$ = 1 ton limestone per acre.

222. The linear responses to phosphate and lime were significant at both the 5% and 1% levels. Ammonia chloride does not appear to be any better than sulphate of ammonia.

223. In addition, three 8 x 5 randomised block experiments, two at Cane Grove and one at Central Agricultural Station, were laid down to investigate the use of alternative types of fertilizers. The results are summarised in Table XV.

224. The No. 2 trial at Cane Grove was on soil high in exchangeable aluminium and sulphates. The results have indicated that the optimum rate of application of fertilizers was in the vicinity of 1 cwt. per acre. For the trials at Cane Grove, the 10:20 NP mixture and ammophos showed no significant difference in yield.

TABLE XV

| Treatments | Yield in lb. (per acre) | | |
|---|---|---|---|
| | Cane Grove | | Central Agricultural Station |
| | No. 1 trial | No. 2 trial | |
| 1 cwt. ammophos per acre 10:30 | 3038 | 1106 | 4970 |
| 2 cwt. ammophos per acre 10:30 | 2982 | 1316 | 4606 |
| 1 cwt. 10:20 NP per acre | 2786 | 896 | 4466 |
| 2 cwt. 10:20 NP per acre | 3038 | 1204 | 4718 |
| 1 cwt. sulphate of ammonia (21% N.) per acre | 2674 | 994 | 4298 |
| ½ cwt. urea (46% N.) per acre | 2800 | 826 | 4550 |
| ¼ cwt. urea (46% N.) + ½ cwt. triple superphosphate (45% w.s. $P_2O_5$) per acre | 2534 | 1316 | 4620 |
| No treatment | 2450 | 574 | 4466 |
| Significant Diff. 5% | - | 442.4 | 410.2 |
| Significant Diff. 1% | - | 596.4 | - |

225. At the Central Agricultural Station, ammophos appeared to have been slightly better than the 10:20 mixture. Urea was not better than sulphate of ammonia.

Insect Pests

226. Investigations into the rice stem-borer complex were aimed at establishing the grain loss due to the boring of the stem during the period of grain formation and the existence of wild hosts. The grain loss, if it exists at all, appears to be slight. Echinochloa polystachya and Hymenachne amplexicaulis have been found to be hosts of Rupela albinella. The incidence of R. albinella appears to be highest in transplanted rice. Metagonistylum minense was found parasitising Diatraea saccharalis in rice at Mahaicony/Abary Rice Development Scheme. Further parasites, of all 3 borer species, not yet identified have been found.

Processing of Rice

227. Glacial acetic acid was imported and distributed free to rice millers by the B.G. Rice Marketing Board as large scale trials by the Department have shown that this acid, at a concentration of about 0.3 to 0.4 % in the soaking water, will prevent the development of unpleasant odour in milled rice if padi soaked for

parboiling has to be kept in the soaking tank for longer than 24 hours during wet weather.

228. Preliminary laboratory work has shown that acetic acid used in conjunction with calcium hypochlorite or with potassium meta-bisulphite may enable the soaking period to be prolonged to 10 - 12 days before unpleasant odour develops.

Rice Storage Investigations

229. Considerable progress was made in the investigations into rice storage problems. The problems under study included:-

(a) methods of measuring moisture content of padi;

(b) insects affecting stored padi and rice;

(c) damage and loss caused through storage insects to padi and rice;

(d) methods of combating these insects;

(e) continuation of bag storage;

(f) the problems of bag versus bulk storage;

(g) the possible use of paper sacks for rice storage;

(h) rat damage.

230. Under local conditions, the most important insects attacking both padi and rice are Calandra oryzae (L), Rhizopertha dominica (Fabr.) and Sitotroga cerealella (Oliv.). Preliminary results indicate that the damage caused by Calandra and Rhizopertha alone in padi may result in a monetary loss to the industry of over $400,000 per annum with an annual production of 1,920,000 bags of padi.

231. Investigations into the other problems listed have resulted in recommendations to reduce loss by insects when stored in bags by low volume spraying each layer and the sides of the stack. The electrical probe type moisture testers appear to be the most convenient and portable, particularly for testing bag-lots of padi. Although bag storage will continue for some time, bulk storage must be generally adopted if there is to be satisfactory control of the storage pests of padi. Designs for bulk padi storage have been drawn up and a method of making a concrete floor vapour proof has been worked out with a view to eliminating dunnage. Trials with in-bin drying were commenced as well as trials in connection with the use of multiple paper sacks for export rice.

CITRUS

232. Applications of an NPK (8:12:15) mixed fertilizer applied at a rate of 10 lb. per tree resulted in marked improvement of unhealthy and poor bearing trees on the ironstone soils of the North West District and on the silty clays on the banks of the Demerara River.

COCONUTS

233. Investigations were continued into the frequent deaths of mature coconut palms growing on soils of low density, at one time of a peaty nature. Applications of NPK (8:12:15) mixed fertilizer in addition to lime, fritted trace elements, sodium chloride and magnesium sulphate were used. Two palms treated with 2 lb. each of fritted trace elements have died. Palms, each treated with 20 lb. of limestone plus 10 lb. of the NPK mixture, are particularly healthy.

Coconut Fibre

234. Samples of bristle grade coconut fibre were despatched to the Colonial Products Laboratory for evaluation. They have stated that manufacturers in the brush trade reported favourably on the samples and stated that provided the fibre was graded properly and prepared in a similar manner to that marketed by Ceylon, a market could probably be found. A further ton of fibre has been despatched to one manufacturer for test while another has requested a ton sample of fibre produced from husks retted in dilute sodium hydroxide solution.

EXPERIMENTS ON PEGASSE SOIL

North West District

235. Work has continued at the Hosororo Experiment Station on the deep pegasse soils which lose fertility after a comparatively short period of cropping. The soil of the experimental site was high in exchangeable aluminium and water soluble sulphates. Factorial fertilizer trials were carried out using maize as the indicator crop to investigate whether it was possible to maintain satisfactory yields of this crop for more than one year. The fertilizers tested were lime, triple superphosphate, muriate of potash and sulphate of ammonia. The indication is that even with the application of fertilizers it may not be possible to obtain economic yields of maize year after year. However, the soils respond to lime and phosphate. The residual effect of phosphate after one year of cropping was appreciable. The highest yield of 2,320 lb. of maize per acre was recorded for the PK treatment in a $2^4$ factorial (replicated) design.

236. Two grasses Brachiaria mutica (Para grass) and Ischaemum timorense (Locuntu grass) were tried out on the semi-worn out deep pegasse at Hosororo. Para grass seems to thrive exceptionally well on these soils. Table XVI records the yields of these 2 grasses: Para grass was cut at 2½ months and Locuntu grass at 3 months of age.

TABLE XVI

| Treatments | Yields in tons (per acre) | |
|---|---|---|
| | Para Grass | Locuntu Grass |
| No fertilizer | 3.5 | 2.1 |
| 50 lb. sulphate of ammonia (21% N.) per acre | 9.0 | 4.1 |
| 50 lb. sulphate of ammonia (21% N.) + 100 lb. basic slag (15 - 16% $P_2O_5$) per acre | 7.9 | 3.1 |
| 50 lb. sulphate of ammonia (21% N.) + 50 lb. triple superphosphate (45% w.s. $P_2O_5$) per acre | 6.5 | 2.5 |

237. Ginger and turmeric appear to do well on the deep pegasse soils.

238. A $3^3$ factorial (confounded), single replicate trial using rice as the indicator crop was also laid down on the semi-worn out pegasse. The mean yields for treatments were as follows in lb. per acre.

| | | | | | |
|---|---|---|---|---|---|
| $N_o$ | 1347 | $P_o$ | 829 | $L_o$ | 1191 |
| $N_1$ | 953 | $P_1$ | 965 | $L_1$ | 822 |
| $N_2$ | 962 | $P_2$ | 1469 | $L_2$ | 1247 |

$N_1$ = ½ cwt. sulphate of ammonia (21% N.) per acre.

$N_2$ = 1 cwt. sulphate of ammonia (21% N.) per acre.

$P_1$ = ½ cwt. triple superphosphate (45% w.s. $P_2O_5$) per acre.

$P_2$ = 1 cwt. triple superphosphate (45% w.s. $P_2O_5$) per acre.

$L_1$ = ½ ton limestone per acre.

$L_2$ = 1 ton limestone per acre.

239. The highest individual plot yield for the experiment was 2,857 lb. per acre for the $N_2$ $P_2$ $L_2$ treatment. The indication is that rice may be a suitable crop for the pegasse soil in its semi-worn out condition. Phosphate gave a significant increase in yield.

PASTURE AND FODDER

240. The museum plots maintained in the Botanical Gardens are small and observations on the species collected and maintained there are therefore limited. Nevertheless, the plots have given evidence that many of the introduced grasses are unsuitable for local coastal conditions where drainage is poor or soils heavy. This will be of advantage when the work is expanded at the Central Agricultural Station.

241. Species which have shown exceptional promise on the coastlands are as follows:-

(i) Ischaemum timorense (Locuntu grass).

(ii) Brachiaria mutica (Para grass).

(iii) Pueraria phaseoloides (Tropical kudzu).

(iv) Centrosema pubescens (Centro legume).

242. Grasses in the collection requiring further trial are Paspalum notatum (Bahia grass), Paspalum dilatatum (Dallis grass), Panicum maximum (Guinea grass), Dicanthium caricozum (Nadi Blue grass), Indigofera subulata and Stylosanthes gracilis. Digitaria decumbens (Pangola grass) appears to be more suited to sandy soils than to the coastal clays.

243. Collections of natural grazing species are being made and further work is required on Leersea hexandra suited to waterlogged conditions as well as certain species of Paspalum and Panicum laxum.

## B. RESEARCH AND EXPERIMENTATION

### (ii) Financed under Colonial Development and Welfare Schemes

### COTTON INVESTIGATIONS

244. The Cotton Officer continued investigations on the crop for the spring and autumn harvests. It is convenient to record some of the findings which appear significant if cotton is to become a crop of importance in British Guiana.

245. It is clear that the sand reef soils are the only suitable ones for the crop. Regular fertilizer application is essential and heavy applications of nitrogenous fertilizer are particularly important. The "barbadense" varieties BLR 14/25 and "coastland" have done sufficiently well, as compared with the upland varieties including BAR 7/8, to decide to plant the former. They command a much better price and make it possible to consider cotton as a crop despite the high cost of production.

246. The reliability of cultivation and picking weather does not favour cotton as a crop in British Guiana. Unseasonal weather can force late planting which in turn throws picking into the middle of the wet season. Cotton as an annual is a risky crop but "ratooning" or the cutting back of the plants and the taking of a second crop has been tried with success. Yields are sometimes better than the first crop and the need for planting an entirely new acreage each season does not arise. The number of times the plants can be cut back has to be determined but the possibility of a farmer having to cultivate only half of his land each season is a distinct advantage. The ratooned acreage will not be as subject to failure as the sown acreage and the riskiness of the crop can be reduced in consequence.

247. The pest and disease factors revolve around Stainers and Black Arm. Stainers are less severe in the spring harvested crop but spraying against this pest will be necessary in both seasons. Black Arm can be crippling on non-resistant varieties.

248. Cotton may be successful with the present market position, provided it can be "ratooned". The crop will not stand neglect, particularly weeding, fertilizing and pest control under local conditions. Only vegetable crops on a limited scale receive the attention that cotton requires and the preparedness of the farmer to grow cotton in this way will decide its future.

### HOSORORO EXPERIMENT STATION

249. This scheme provides for the development of the station and the appointment of an Agricultural Officer to take charge of the work of the station. Failure to recruit a suitable officer has again retarded development. The District Extension Officer has had to continue in charge of the station and the work done has been recorded elsewhere in this report.

## EBINI LIVESTOCK STATION

### The Herd

250. The formation of single sire units continued. The cattle are now disposed of as follows:-

| | Bulls | Cows | Calves | Heifers | Steers |
|---|---|---|---|---|---|
| Multiple sire unit | 6 | 138 | 79 | - | - |
| Cows for drafting to single sire units | - | 37 | 19 | - | - |
| Sahiwal unit | 1 | 52 | 22 | - | - |
| Brahman unit | 1 | 28 | 10 | - | - |
| Santa Gertrudis unit No. 182 | 1 | 3 | 5 | 26 | - |
| " " " No. 177 | 1 | - | - | 16 | - |
| " " " No. 200 | 1 | 5 | 2 | 18 | - |
| Steer herd and young stock bulls | 7 | - | - | - | 124 |
| Heifers | - | - | - | 55 | - |
| Milking cows, pure bred stock, etc. | - | 5 | 4 | 3 | 6 |
| Total | 18 | 268 | 141 | 118 | 130 |

251. The 7 young stock bulls are half bred Sahiwal, generally of better type than the Zebu half breds formerly produced. The imported Santa Gertrudis bulls graze well and are in good condition but appear slow workers. Both Santa Gertrudis type heifers calved in October; the calves, a bull and a heifer are very satisfactory. The Hereford bull died of tick fever in December.

252. There were no reactors to the TB test carried out in March. During the year 27 steers and 16 cows were slaughtered for sale to the Reynolds Metals Company. The killing percentage for steers was 47% and for cows 40%.

### Building and Works

253. A trail for wheeled traffic, 2 miles 28 rods in length, to the Berbice River is in course of construction. A new house for the foreman has been built. A further 8 miles of fencing has been erected and there are now 10 range paddocks .

### Improved Pastures

254. Ten improved pastures (including the air strip) give 138 acres of good grazing. A further 50 acres have been fenced and are ready for cultivation and planting. These pastures have all been given an application of 3 cwt. per acre of basic slag.

Mineral Deficiency Requirements

255. The consumption of minerals per head during the year has been 25 lb. Churns Trace Elemented Bone flour plus 12½ lb. rock salt.

Other Crops

Citrus

256. The orchard continued to thrive and yield good crops of grapefruit and oranges with normal fertilization. Gummosis is endemic but can be adequately controlled by routine inspection and treatment.

Miscellaneous

257. The station continued to produce cassava and other root crops and bananas in the cleared forest areas on a shifting cultivation basis.

ST. IGNATIUS LIVESTOCK STATION

General

258. The speed of development of this station increased with the arrival of an Agricultural Officer in the middle of the year. The staff was further strengthened by the posting of a second Veterinary Officer on the station at the end of the year.

The Herd

259. On the relaxation of the Foot-and-Mouth disease preventative measures in January, it was possible to begin the purchase of additional heifers to build up the herd of 80 animals. The rate of expansion depended on the speed of erection of sub-division fences. At the end of the year purchases together with the calf crop had built up the herd to 192.

260. Three Santa Gertrudis bulls and 2 heifers were returned to the station on the relaxation of the Foot-and-Mouth disease control. The Hereford bull maintained condition although some difficulty was experienced with servicing due to its stature.

Buildings and Work

261. Two senior staff quarters were completed and servants quarters erected. An aluminium house was erected for a stockman. Electricity from Lethem was connected to all quarters on the station. The domestic water supply was improved.

Fencing

262. The fencing programme was held up somewhat by a shortage of posts due to transportation difficulties. Fences were erected and a new corral was nearing completion at the outstation. The sub-division fences for the station were finalised and mapped on receipt of the soil map of the station.

Pastures

263. Trial plots of the following grasses and legumes were established:

(a) Panicum maximum (Guinea grass).

(b) Melinis minutiflora (Wynne grass).

(c) Hyparrhenia rufa (Jaragua).

(d) Chloris gayana (Rhodes grass).

(e) Paspalum notatum (Bahia grass).

(f) Pueraria phaseoloides (Tropical kudzu).

Other Crops

264. Tobacco and cotton were again grown with disappointing results. On the open savannah in spite of very heavy fertilization, tobacco yields were poor as was quality. The Tobacco Company decided at the close of the year to discontinue trials in the Rupununi.

CACAO DEVELOPMENT SCHEME

265. At the beginning of the year, it was decided that the experimental work on cacao had yielded sufficient information to permit embarking on large scale production of clonal plants for distribution to farmers. The programme of work for the year was drawn up with a view to establishing the old centres of propagation (Atkinson Field, Providence and Hosororo) on a permanent basis producing 20,000, 10,000 and 10,000 plants annually respectively, and to establish a new centre of propagation at La Belle Alliance, Essequibo, to produce 10,000 plants annually.

266. Completely new hardening sheds were built with aluminium and glass roofing and the appropriate number of propagating bins was erected at each centre. New nurseries were cleared and planted with shade.

267. During the period of construction, propagation of clonal plants was held up temporarily for the last 3 months of the year. A total of 21,427 cuttings was propagated, 8,086 plants distributed and 3,594 plants used in extending nurseries. At year end, there were 18,711 plants held in storage on the hardening floor.

268. The Colonial Development and Welfare grant was extended from 1st April to the end of the year.

JUTE

269. In the interest of economy and easy availability of specialist assistance, it was decided to move the jute experiments from Enterprise estate, East Canje, to the new Central Agricultural Station, East Coast, Demerara, on the conclusion of the 1956 autumn crop. Cultivation equipment was first moved in the latter half of 1956, a new processing building erected, a start made on the building of retting tanks and 47 acres of jute were planted at the end of the year for the 1957 spring crop harvest.

270. The 1956 spring crop harvest indicated that the variety BZ/3 will produce a spring crop for fibre. Yields of fibre averaged 9.1 cwt. per acre for jute planted in November 1955. December 1955 plantings resulted in lower fibre yields due to the shorter growing season. The varieties BZ/1 and BZ/2 are also suitable for growing as a spring crop for fibre. The varieties E.C.R. 576, BZ/4 and BZ/5 will only produce a seed crop when a spring crop is taken.

271. The rainfall in April was below average which resulted in late germination of the autumn jute crop but favoured weed growth. 259 acres were planted of which 126 acres were harvested for fibre mainly because of the failure of a considerable acreage to reach satisfactory height for fibre production due to weed competition. Although some excellent jute for fibre was grown, fibre yields were inexplicably low. The estimated fibre yield from the acreage reaped was 36 tons, individual field yields varying up to ½ ton of fibre per acre.

272. The varieties E.C.R. 576, BZ/1, BZ/2, BZ/3 and BZ/5 produced a fibre crop in the autumn and performed as was expected. The variety BZ/4 produced a good fibre crop for the first time and is now included in the list of varieties capable of producing an autumn crop of fibre.

273. Further modifications to certain of the specialized machinery previously developed were carried out and tested. 47 acres of jute were planted on the Central Agricultural Station for the 1957 spring crop harvested.

274. These experiments have been financed by a Colonial Development and Welfare grant since 1st April, 1956.

SOIL SURVEY COAST

Blocks I and II, Courantyne

275. The field investigations of the soil survey of Blocks I and II Courantyne, an area of about 27,000 acres, have been completed by the 2 soil surveyors provided by the United States Operations Mission. This area was most inaccessible due to submergence all the year round and patches of thorny vegetation. These conditions retarded the rate of progress of the survey thus lengthening the time of completion and, simultaneously, adding to the cost. From aerial photographs of the area, base maps are being provided by the Directorate of Colonial surveys in the United Kingdom and the report and soil maps are in course of preparation.

276. The survey has indicated that over 80% of the area is of one soil type which is suitable for rice, pastures and most vegetable crops. This soil is relatively young being developed from alkaline and saline marine sediments. A very small area may not be suitable for immediate agricultural use as examination of some of the samples has revealed an acid-sulphate soil occurring in limited patches.

Boerasirie West

277. In the Boerasirie area, West Coast, Demerara, the Contractors, Sir Lindsay Parkinson & Company Ltd., have made good progress in constructing the drainage and irrigation works which should make about 60,000 acres of land available for agriculture.

278. The soil survey of a part of this area of about 25,492 acres was carried out by one of the soil surveyors provided by the United States Operations Mission. The report and soil maps have been completed. The other section, known as Boerasirie East, will be surveyed as soon as possible.

279. In the report on Boerasirie West, the soils have been classified as follows:-

(a) Mineral soils occurring as silty clay loams and as silty clays make up 7,372 acres or approximately 20% of the total.

(b) Shallow pegasse (tropical peat) less than 12 inches in depth, accounts for 3,873 acres or about 15% of the total.

(c) Pegasse, 12 - 36 inches in depth, covers 9,241 acres or approximately 36% of the total.

(d) Pegasse, 36 - 60 inches in depth and over, accounts for 2,371 acres or about 9% of the total.

(e) Burned pegasse of very low fertility makes up 2,635 acres or approximately 11% of the total.

280. Of the mineral soils, the Boerasirie mucky clay is high in exchangeable aluminium. The salt content (conductivity) is low, indicating the absence of toxic amounts of sulphates. Analysis of samples for sulphates showed the highest amount present to be around 310 p.p.m. as $SO_4$.

281. The shallow pegasse, less than 12 inches in depth, contains high amounts of exchangeable aluminium. The Salem pegasse contains somewhat high amounts of sulphates at 45 - 72 inches in depth whereas the Hubu pegasse does not contain excessive amounts of sulphuric acid.

282. The pegasse, 12 - 36 inches and 36 - 60 inches in depth, contains toxic amounts of exchangeable aluminium and in some cases high sulphates. Further evidence of this condition was shown in the big drop in pH values on air-drying the samples.

283. The burned pegasse soils are very high in aluminium and sulphuric acid, the Uitvlugt pegasse being the worst. These soils are highly infertile and very little agricultural use can be made of them.

Reconnaissance Survey

284. A reconnaissance soil survey of the coast was also carried out by a soil surveyor provided by the United States Operations Mission and, for the first time in the history of the Caribbean, a helicopter was used in the survey. This machine has proved to be most useful, particularly under local swamp conditions. The report and soil maps are in the course of preparation. This survey has revealed that in some areas, the "Coropina" type of soil is present. This soil type is of very low fertility and possesses a hard pan at lower depths.

## SOIL AND LAND USE SURVEY - INTERIOR

285. An area of about 1,200 square miles in the southern savannahs of the Rupununi has been surveyed by soil surveyors attached to the Regional Research Centre at the Imperial College of Tropical Agriculture, Trinidad. A soil map has been prepared and the report is in course of preparation.

286. In addition, the northern savannahs of the Rupununi have been surveyed. The report and maps are being prepared.

287. The preliminary indications are that the soils of the Rupununi savannahs are more or less very sandy in character (White Sand Series) and are of low inherent fertility.

288. The survey was temporarily held up during the year on account of lack of suitable staff. It was resumed with a complement of 3 soil surveyors, 2 of which were appointed in the latter half of the year.

CENTRAL AGRICULTURAL STATION

289. Negotiations were concluded for the purchase of Mon Repos Estate, situated about 9 miles from Georgetown, and the property was taken over and development started. The land was purchased and capital development will be carried out with Colonial Development and Welfare funds.

290. The station is about 1,000 acres in extent and consists of a narrow strip running from the sea to the conservancy. The shape of the property is unusual for an agricultural station but has the advantage of containing soils representative of those occurring on the coastlands.

291. Development consisted of the construction of roads and bridges, the preparation of sites for housing, farm buildings, laboratories and offices, and a start was made on the construction of houses and farm buildings. An artesian well was dug.

292. The rice breeding programme was moved to the station as well as some animals from the Georgetown Livestock Farm. Fodder grasses were planted.

293. A start was made in the movement of the jute investigations, formerly carried on in Berbice, to the station in August and a number of fields were sown to jute in November. The investigations, being carried out with the aid of Colonial Development and Welfare funds as from April 1956, call for the planting of 300 acres of jute annually. Cultivation equipment and trained junior staff were moved to the station in August and, by the close of the year, certain farm buildings required for jute were erected. The move to the station will not be completed until the middle of 1957. The presence of jute cultivation and other equipment materially assisted the development of the station.

294. The laboratories and offices were designed by the Public Works Department architects. It is expected that this building will be completed by the end of 1958.

SUGAR-CANE DISEASES RESEARCH

295. The scheme commenced in 1950 and was concluded at the end of the year. As a result, it can be stated that Leaf Scald disease is no longer a threat to the industry. In the main, control has been achieved by the use of resistant varieties which have been proved by growing cuttings steeped in an infusion of infected material. The main varieties now grown on estates, namely B.37161 and B.41227, are different from those grown when Leaf Scald was at its height. Rats and contaminated cutlasses were proved to be the main methods of spread of the disease and the use of "warfarin" baits for rats has been developed. Formalin treated cutlasses can control spread at planting time but the most important consideration is the use of disease free resistant planting material. A complete report of the work carried out under the scheme is in course of preparation.

FERTILIZER INVESTIGATIONS ON RICE

296. The Soil Scientist, Mr. J.K.R. Gasser, submitted his report on "The Use Of Fertilizers In Increasing Rice Yields In British Guiana And Their Role In The Nutrition Of The Rice Plant Under Waterlogged Conditions". These findings are as follows:-

(a) The effects of anaerobically fermenting rice straw (Oryza sativa) on the mobilization of aluminium, calcium and iron phosphates

There was some evidence of the formation of insoluble aluminium organic complexes; the solution of di-calcium phosphate could be attributed to the lowering of the pH; extensive mobilization (solution-reduction) of the iron occurred. Interactions between the various cations were noted, in particular both aluminium and calcium depressed the monilization of iron. These results were in agreement with effects noted by other workers, particularly the increase in dilute acid soluble phosphate occurring on waterlogging acid soils, attributed to the reduction of ferric phosphate. It was proposed that in assessing the phosphate status of rice soils, the ferric phosphate should be considered as an "available" form. Therefore, a re-examination of methods used in advisory work appeared desirable.

(b) Study of the effects of applications of nitrogen, potassium and phosphorus fertilizers and lime on the yield of rice grain

Samples from selected sites were analysed for the effects of the experimental treatments on the nitrogen, phosphorus, potassium and calcium contents of the straw and grain. By combining the field and analytical data, the effects on total uptake were calculated and hence the efficiency of utilization of the applied nutrients was found. Soil samples from the sites of the experiments were analysed for some of their chemical and mechanical properties. The data were considered in conjunction with the field results to show the interrelationship between the pedogenesis under natural and agricultural conditions and the response to fertilizer applications. The main findings are given below.

(i) Soils

Under natural permanent waterlogged conditions the phosphate moved down the profile and was lost in the groundwater. This was presumed to have occurred as an iron-organic-phosphate complex from the evidence of previous laboratory work. The surface organic layer formed under permanent waterlogged conditions was found to contain higher amounts of exchangeable aluminium than the underlying soil. In some cases the concentration was so great that aluminium toxicity occurred when the land was subsequently used for rice growing. This was considered to be due to the presence of possible aluminium accumulating species in the flora. When the soils were drained for agriculture, there was evidence that continued rice growing caused a downward movement of phosphate from the cultivated layer. Part of this phosphate was redeposited in lower horizons, which gave increased values for the dilute acid soluble phosphate.

(ii) Nitrogen

In general, the field data showed that the application of nitrogen at seeding or transplanting gave only small

increases in the yield of grain. The analyses of the grain indicated no increase in the nitrogen content of the grain by the application of fertilizers. Some evidence for a deleterious action by the sulphate ion and a greater tolerance towards the chloride ion was found.

(iii) Phosphorus

The major response was to phosphorus, and, in particular, the soil type was found to affect the response. Yield increases from applied phosphate were found under 2 conditions, on soils with high exchangeable aluminium and soils whose reserves were exhausted by crop removal and natural leaching. The aluminium toxic soils all belonged to the pegasse or pegassy-clay classes, i.e., they were formed under waterlogged conditions. Exhaustion was particularly noted on soils with good sub-soil drainage. The laboratory analyses showed that the application of phosphorus to deficient soils increased the phosphorus content of the grain. It was also found that, in severely deficient soils, the applied phosphorus was first utilized by the plant to increase the yield and, as the yield approached the maximum, an increase in phosphorus content occurred. The application of phosphorus to deficient sites reduced the nitrogen content of the straw and grain, had variable effects on the potassium content of straw and grain and increased the calcium content of the grain. There was some evidence for an interaction between phosphorus and calcium on the physiology of the grain.

(iv) Potassium

The soils studied all had adequate supplies of potassium for rice growing.

(v) Calcium

Very small yield increases were recorded from dressings of lime, even on the aluminium toxic soil. A comparison of "wet" and "dry" soil conditions suggested that the results of liming on a "dry" soil were achieved by the flooding and reducing conditions of a "wet" soil. In particular, the organic matter was important.

(vi) Grain Weight

The effect of the experimental treatments on the whole grain weight was also studied. The whole grain weight was found to be increased by treatments giving large yield increases.

## C. VETERINARY AND ANIMAL HUSBANDRY

### ANIMAL HEALTH

#### Bacterial and Virus Diseases

(i) Anthrax

297. Two suspected cases occurred at Mackenzie. 215 cattle were inoculated with Anthrax vaccine and no further deaths occurred.

(ii) Tuberculosis

298. Tuberculin tests were carried out on all Government owned cattle and no reactors found. All Land Settlement cattle were tested. Of a total of 800 cattle tested, only 8 were positive, giving 1% reactors, which is remarkably low.

(iii) Contagious Abortion - Bangs Disease, Brucellosis

299. No cases of Brucellosis were encountered during the year.

(iv) Mastitis

300. Sporadic cases were encountered during the year. These showed a favourable response to antibiotic therapy.

(v) Strangles (Equine Distemper)

301. No cases reported.

(vi) Fowl Pox (Yaws)

302. This disease continued to appear in flocks. Vaccination was carried out on a fairly large scale. A country wide vaccination programme against this disease was initiated.

(vii) Equine Encephalomyelitis

303. No cases reported.

(viii) Paralytic Rabies

304. Outbreaks of this disease continued on an increasing scale amounting to epidemic proportions, especially in the Rupununi area, the worst areas being in the vicinity of the Rupununi River and Kanuku Mountains. Vaccination was continued in the Demerara River area and an outbreak occurred on the Berbice River. This is the first known case in the latter area.

305. Inoculations were as follows:-

| | |
|---|---|
| Cattle | 5,000 |
| Horses | 211 |
| Total | 5,211 |

(ix) Foot-and-Mouth Disease

306. Precautionary measures were re-introduced in the Rupununi as the result of further outbreaks in the Rio Branco area of Brazil. These measures were successful.

(x) Swine Fever

307. An outbreak was dealt with during the year. The origin of the outbreak was probably pigs imported from the United Kingdom. It was successfully dealt with by serum inoculation and the use of Crystal Violet vaccine. Preventive measures are still continued at the Livestock Farm but the original herd has now been dispersed.

Protozoal Diseases

(i) Anaplasmosis and Piroplasmosis

308. 52 cases of Anaplasmosis and 6 cases of Piroplasmosis were treated. These figures are no true indication of the number of cases that occur as all the cases occurring are not reported and many animals die or recover without treatment. Premunisation of young stock at the Livestock Farm continued as in previous years.

(ii) Equine Trypanosomiasis

309. Cases occurred sporadically on the northern savannahs of the Rupununi District. Two suspected cases in imported horses were dealt with on the coastal area. Treatment with Ethidium Bromide has been quite successful.

(iii) Trichomoniasis

310. No cases reported. Almost all of the Government owned bulls, with the exception of range cattle in the beef cattle areas, are denied natural service which curtails the incidence of this disease.

(iv) Coccidiosis in Other Animals

311. Thirty cases were encountered and treated which represents an increase over the previous year.

(v) Coccidiosis in Poultry

312. This disease is quite prevalent in young stock but responds to preventive measures by Sulphaquinoxaline and Sulphamezathine.

(vi) Histomoniasis

313. There was an increase in this disease in poultry which was readily controlled by the use of Entramin and Neftin.

Internal Parasites

314. Routine dosing of livestock with Phenothiazine continued together with the use of Tetracap. capsules. Kavian tablets were used for poultry. Nodular worms were encountered in sheep and poultry.

External Parasites

(i) Mange

315. No cases of Sarcoptic mange were recorded in horses or cattle.

(ii) Ticks

316. Ticks are prevalent and are the vector of Anaplasmosis and Piroplasmosis and anaemia.

(iii) Screw Worms

317. These attach themselves to wounds and are particularly troublesome in new born calves, attacking the navel.

(iv) Skin Nodular Worms

318. These parasites were also encountered.

Fungus Disease

319. Two hitherto unknown diseases were diagnosed in poultry. These are Thrush (Moniliasis) and Aspergillosis. Favus was also discovered in poultry and an outbreak of Ring Worm was seen in sheep.

Clinical Service and
Post Mortem Examinations

320. 2,395 clinical diagnoses were carried out compared with 3,269 in 1955. 337 post mortem examinations were carried out, an increase of 123 over the previous year.

VETERINARY RESEARCH

321. The time devoted to research was of necessity curtailed. Nevertheless, the following conditions were investigated.

Cirrhosis of the Liver

322. Cirrhosis of the liver in cattle on the savannahs was investigated and diagnosed as Hepatogenous Photosensitisation. A special mineral mixture was prepared with a high sodium and magnesium content with the object of counteracting the effects of the phyloerythrin produced by the toxin. The sodium is used to prevent cirrhosis and the magnesium to counteract the removal of the magnesium ion from the chlorophyll. Preparations are being made to feed this mineral mixture as a preventive.

Mineral Deficiencies

323. A form of "swayback" was encountered in lambs 2 - 4 months old on the coast. This was diagnosed as copper deficiency and dealt with accordingly. Results were good as even affected animals were cured and preventive measures by feeding copper in mineral mixtures have been adopted.

324. Infertility in cattle has been a problem of long standing. An experiment with 40 heifers was commenced at the Central Agricultural Station. The animals were between 2 and 3 years of age. Twenty were dosed weekly with copper and cobalt sulution and the remainder left as controls. The dosed heifers were in better condition and, at the end of 3 months, 5 were found to be in calf as against 1 of the control group.

Amerindian Fish Poisons

325. An experiment was carried out to check the toxicity of 3 well known Amerindian fish poisons. There were Komarau (Euphorbia cotonoides), Kuru-kuru-why (Lonchocarpus sp.) and Kunami (Clibadium surinamense). Of those tested, the Lonchocarpus root was the most toxic. A list of all known fish poisons was compiled.

Poultry

326. Three new diseases were diagnosed - 2 of these being fungus diseases, namely, Aspergillosis and Moniliasis

and, the third, what is regarded as the nutritional disease "Round Heart". An outbreak of Infectious Bronchitis was also investigated and was treated:

(i) by vaccination with Newcastle Disease/Infectious Bronchitis vaccine; and

(ii) with Vitamin A, as there was a possibility that it may have been associated with Avitaminosis A.

ANIMAL BREEDING AND ANIMAL HEALTH

Dairy Cattle

327. The $F^2$ cross from the Holstein-Sahiwal is unsatisfactory. It is proposed to concentrate on the 5/8 to 3/4 Holstein cross for milk production.

328. The Sahiwal bull purchased in 1955 from Trinidad was put into service. No calves are yet available.

329. Many dairy cattle with problems of sterility belonging to farmers, sugar estates and the Livestock Farm were treated with considerable success.

330. On the Livestock Farm the total production of milk was 179,126 pints as compared with 186,360 for the previous year.

331. The Revolving Heifer Scheme was continued with the animals purchased in 1955. It was not found possible to purchase the remainder of the animals necessary to bring the number up to 150, as originally envisaged, as funds were not made available. Heifers in calf were distributed and a few heifer calves were returned.

Beef Cattle

332. With the relaxation of Foot-and-Mouth disease preventive measures in the Rupununi, the Santa Gertrudis bulls and heifers belonging to the St. Ignatius Livestock Station and the Rupununi Development Company were returned to the Rupununi. The Santa Gertrudis bulls at Ebini and St. Ignatius were put to work and the first calf crop commenced towards the end of the year. One pure bred Santa Gertrudis bull calf and one heifer calf were born at Ebini and these show promise.

333. The Sahiwal bull at Ebini in a breeding unit produced good calves with fair beef characteristics.

334. One of the 2 Hereford bulls presented by the Reynolds Metal Company was stationed at Ebini and the other at St. Ignatius Livestock Station. Unfortunately, the Ebini bull died at the end of the year from tick fever.

335. The St. Ignatius breeding herd was increased by the purchase of 114 heifers from the Rupununi Development Company.

Pigs

336. The breeding of Large Black and Large White pigs continued to supply pure bred stock to farmers. The Marketing Division secured an export market in Trinidad for surplus pork. This market requires a leaner carcase than

is customarily produced and this requirement is being met by encouraging farmers to use Large White pigs for breeding and crossing purposes, and by encouraging the earlier slaughter of pigs.

337. The Large Whites have given good sized litters and are early maturing.

Sheep

338. The Livestock Farm sheep are generally of poor type with poor mutton characteristics. The greatest weakness in the flock is the presence of an overshot jaw which is a hereditary character. The importation of Border Leicester sheep is planned to upgrade the existing flock.

Goats

339. The goats show the same jaw weakness as the sheep. A programme of up grading the flock is in course of preparation.

Donkeys

340. The donkeys also show a jaw deformity. In this case the jaw is undershot to a varying degree from slight to grossly undershot. This again is a hereditary weakness. Of the 2 jacks being used 1 shows the deformity. It has been decided to use only the jack that is normal for future breeding.

Poultry

341. The laying flock at the Livestock Farm was 854 birds as compared with 491 for 1955 and egg production was 77,289 as compared with 75,036 for the previous year. The discrepancy in production in relation to numbers is explained by the fact that 854 represents the figure in production at the end of the year. Most of these were pullets which had come into production only towards the end of the year.

342. Further progress was made in local production. The increase was such that, in the first 8 months, broiler production was doubled. Imports of poultry carcases were allocated in relation to home production.

343. The Livestock Farm continued a programme of exchange of cockerels with farmers in which one pure bred cockerel was exchanged for a creole cockerel, the latter being disposed of as meat.

344. The following were distributed from the Livestock Farm to improve local breeds:-

| | | |
|---|---|---|
| Cockerels | - | 418 |
| Pullets | - | 918 |
| Chicks | - | 13,671 |
| Hatching Eggs | - | 1,721 |

## D. FISHERIES

345. The Fishery Services of the Department are operated as separate divisions covering the Marine fisheries and the Inland bodies of water such as rivers, canals and reservoirs.

Marine

346. An Ordinance to regulate fishing in the waters of the Colony was passed during the year but the regulations which were drafted, have not yet been passed.

347. Considerable time was spent in supervising the construction of the Wholesale Fish Market which was completed and will be put into operation early in 1957. A tank and pump for supplying fishermen with gasolene was incorporated in the project.

348. A modern retail fish shop was established at the Government Produce Depot. This shop handled, during the period August to December, 59,186 lb. of fish valued at $13,419.63.

349. The construction of a fisherman's lodge and shrimp drying floor was commenced at Bagotstown, East Bank, Demerara, on an aided self help basis. The construction of the shrimp drying floor was completed but the fisherman's lodge was incomplete at the end of the year. Sites for similar structures have been selected in other parts of the country.

350. The activities of the Co-operative Officer centred around the organisation of Co-operative Societies; 11 societies were organised.

351. Financial assistance continues to be provided to fishermen by the refund of duty on all fishing gear, gasolene, lubricating oil, fleselene and net preservative purchased for use in the industry. During the year $24,654.01 was paid out in refunds.

352. The B.G. Credit Corporation granted 8 loans totalling $22,320.00 to fishermen for purchasing new engines and equipment, repairing their boats and equipment and building new boats.

353. Two wire-mesh fish traps measuring 50 rods x 25 rods were erected at Wakenaam. The average monthly returns of fish from these were 335 lb.

Inland

354. The division continued to promote the culture of fish in ponds stocked with Tilapia mossambica, Israeli and Punten Carp (Cyprinus carpio) and local fishes. The latter are mullets (Mugil sp.), snook (Centropomus undecimalis), tarpon (Megalops atlanticus), bashaws (Plagioscion sp.), morocot (Myelus sp.), arawana (Osteoglossum bicirrhosum), creek patwa (Geophagus surinamensis) and Leporinus and Anostomus sp.

355. The experimental ponds and hatchery in the Botanical Gardens now extend over 3.4 acres with 23 ponds of various sizes and 4 rice field fish ponds. There is complete

water control on each pond with depths varying from 3 - 4½ feet. 40,000 fingerlings of tilapia were distributed to farmers' ponds, sugar estate flood fallow fields, ponds of mining companies, schools and Government institutions.

356. Fish culture trials with Tilapia mossambica have shown that a deep and wide peripheral drain and a centre drain 3 feet deep and 4 feet wide help the fish to escape from predators, mainly Hoplerythrinus (the Houri). A collection ditch 6 feet wide and 3 feet deep over the entire outlet side of the bed is necessary. Fencing against alligators also reduces losses.

357. Introductions of Israeli and Punten Carp, mainly for culture on sugar estate ponds and fields, have been made. The difficulty with this type of fish is to obtain spawning and the raising of the small fish. The adults have grown well.

358. Work in connection with the culture of fish on sugar-cane, flood fallow fields continued but final results are not yet available. A 15 inch 3 lb. tilapia has been recovered. The predator fish and alligators make this type of fish culture difficult.

Brackish Water Fish Culture

359. The construction of ponds at Onverwagt, on the West Coast of Berbice, commenced to enable the study of the culture of tarpon, mullets and snook on the tidal flats.

## E. MARKETING DIVISION

360. The general policy of the division remains unchanged, namely, encouraging local agricultural production, by offering producers an assured market, paying economic prices and generally maintaining fair prices and equitable distribution of supplies to consumers.

361. A total of 135 persons were employed in various categories during the year. The following services were operated by the Marketing Division:-

(I) Government Produce Depots (3)
(II) Processing Factory
(III) Livestock Control Organisation
(IV) Ham and Bacon Factory
(V) Milk Control Organisation.

362. The trading results of the Marketing Schemes were as follows:-

| | Expenditure ($) | Revenue ($) | Loss ($) |
|---|---|---|---|
| Government Produce Depots | 61,060.72 | 27,674.74 | 33,385.98 |
| Livestock Control Organisation | 43,455.26 | 9,814.66 | 33,640.60 |
| Processing Factory | 55,340.31 | 51,600.32 | 3,739.99 |
| Bacon and Ham Factory | 16,810.00 | 13,141.68 | 3,668.32 |
| Milk Control Organisation | 54,833.42 | 20,593.13 | 34,240.19 |
| Cold Storage Plant | 22,560.08 | 5,530.70 | 17,029.38 |
| Marketing Division (Administrative and Central Services) | 15,709.91 | - | 15,709.91 |
| Total | 269,769.70 | 128,355.33 | 141,414.37 |

363. Total sales amounted to $1,276,698.48. The loss incurred by the division represents a subsidy of 11 cents on each dollar's worth of goods sold.

(I) GOVERNMENT PRODUCE DEPOT

364. The depot maintained centres for purchasing farmers' produce at Kumaka and Morawhanna (North West District), Charity and Diamond (Pomeroon), Parika (West Demerara), New Amsterdam (Berbice) and Georgetown. With the exception of New Amsterdam and Georgetown which operated on a wholetime basis, these centres were visited fortnightly or weekly by Marketing Assistants on such days as the Government steamer made its call.

365. The supply of ground provisions was for the most part inadequate and the depot had to face up to keen competition from hucksters and, moreover, suffered the disadvantage of having to support its laid down policy of paying farmers economic prices for produce which, by reason of its unsatisfactory quality, often did not induce consumer demand and, consequently, resulted in financial loss.

366. Wholesale trading was done with retail traders (hucksters), Government institutions and other large consumers. Retailing of produce was carried on at the Central Depot, Bourda Branch and New Amsterdam. The C.O.D. service continued to be satisfactory and might well have expanded considerably had a more modern and effective means of delivery been available.

Plantains and Ground Provisions

367. Plantains and ground provisions showed a decline on the previous year's supply; plantains, tannias and eddoes being most affected. Farmers' prices were well maintained and in some cases were above previous levels.

368. 810,686 lb. of these commodities were purchased for $41,520.41 as compared with 836,078 lb. valued at $45,595.82 in 1955. The quantities and value of the individual items were as follows:-

| | | | Average price per lb. |
|---|---|---|---|
| Plantains | 520,744 lb. valued | $26,941.26 | 5.2 cents |
| Sweet Potatoes | 116,630 " " | 6,016.34 | 5.2 " |
| Yams | 67,232 " " | 3,958.87 | 5.8 " |
| Tannias | 20,645 " " | 1,157.90 | 5.6 " |
| Eddoes | 74,093 " " | 3,032.33 | 4.1 " |
| Sweet Cassava | 11,342 " " | 413.71 | 3.6 " |
| Total | 810,686 " " | $41,520.41 | |

369. The inadequacy of supplies of plantains and certain varieties of ground provisions compelled regular importations of this produce from Dutch Guiana. Most of the importations found a ready market on the Courantyne and in New Amsterdam, but quantities also arrived for the Georgetown markets.

Fruits

370. Supplies from the North West and Pomeroon were somewhat disappointing. Farmers' prices on citrus fruit remained firm throughout the year. Here again importation from Surinam on an even more extensive scale has been necessary.

Purchases from all sources were:-

| | 1955 | | 1956 | |
|---|---|---|---|---|
| Bananas | 22,997 lb. | - $3,365.31 | 17,313 lb. | - $2,857.86 |
| Oranges | 56,086 only | | 55,867 only | |
| Grapefruit | 34,775 " | | 14,098 " | |

Cassava Starch

371. Peasant producers appeared discouraged by competition from West Indian arrowroot starch. Only negligible quantities were available. Purchases amounted to 3,811 lb. valued at $477.47.

Coffee and Cacao Beans

372. 26,355 lb. of coffee beans were purchased at a cost of $15,946.60 while purchases of cacao beans amounted to 26,825 lb. valued at $6,824.05. The quality of cacao beans was very unsatisfactory due principally to poor fermentation and inadequate drying. The average price paid was 25½ cents per lb. Farmers' prices for coffe beans showed some decline, averaging between 54 and 62 cents per lb. Purchases by the depot were again confined to meeting the requirements of Government institutions and sales to local processors of ground coffee.

Plantain Flour

373. Sales of this by-product showed considerable improvement over the previous year, although supplies did not keep pace with the demand due to cessation of manufacture at the Processing Factory during the last quarter.

Livestock Feeds

374. The depot continued to act as a distribution centre for feeds manufactured by the Processing Factory and for their components comprising both local and imported commodities. A change in policy allowed of direct sales by the factory, which also took over control of sales on consignment to outstations. This resulted in a material reduction in the value of sales by the depot. A comparative statement of feeds and components follows:-

| | 1955 | | 1956 | |
|---|---|---|---|---|
| | Lb. | Value | Lb. | Value |
| Georgetown | 1,249,355 | $74,211.14 | 392,544 | $29,508.04 |
| New Amsterdam | 218,904 | 15,322.20 | 101,870 | 8,013.48 |

375. Other products manufactured by the Processing Factory and distributed by the depot included corn meal, plantain flour and corn germ.

Veterinary Supplies, Insecticides and Fertilizers

376. Sale of these commodities by the depot, and also through the District Agricultural Superintendents and Instructors acting as distributing agents for the Government Produce Depot, continues to provide a valuable service to farmers generally and more particularly so to those in remote areas.

Ice

377. Government's policy not to manufacture and sell ice on a commercial scale remained in force. There was, therefore no revenue from this source. Manufacture for domestic use was, however, carried on.

Cold Storage

378. Operation of the 5 rooms was satisfactory throughout the year. Revenue amounted to $5,530.70, and the cost of operation was $22,560.08. The cost to Government for operation was therefore $17,029.38.

(II) PROCESSING FACTORY

379. The factory demonstrated its usefulness to farmers and proved invaluable in facilitating the Department's efforts to improve and expand the livestock industry. Inadequacy of supplies of the lower priced grade of rice and replacement of obsolete machinery were the reasons mainly responsible for the trading loss shown.

Livestock Feeds

380. Hereunder is a comparative statement of feeds manufactured in the years 1955 and 1956 which shows a total increase in production of 449,151 lb. compared with the production in 1955.

| | 1955 | 1956 |
|---|---|---|
| | lb. | lb. |
| Chick Starter .. .. | 61,940 | 96,983 |
| Growing Mash .. .. .. | 177,617 | 190,036 |
| Layers Mash .. .. .. | 534,047 | 578,651 |
| Grower-Layer Mash .. .. | - | 1,000 |
| Poultry Feed Mixture .. .. | 900 | - |
| Broiler Mash .. .. .. | 560 | - |
| Breeder Mash .. .. .. | - | 1,000 |
| Broiler Starter .. .. | - | 1,745 |
| Broiler Finisher .. .. | - | 790 |
| Dairy Meal .. .. .. | 446,500 | 623,041 |
| Cattle Feed .. .. .. | 211,242 | 28,700 |
| Calf Gruel .. .. .. | 41,960 | 6,480 |
| Calf Feed .. .. .. | 28,000 | 3,000 |
| Calf Meal .. .. .. | 5,400 | 41,002 |
| Pig Starter .. .. .. | 145,875 | 206,876 |
| Pig Grower .. .. .. | 108,420 | 354,841 |
| Pig Finisher .. .. .. | 117,457 | 82,000 |
| Pig Meal .. .. .. | 58,774 | 2,660 |
| Pig Feed .. .. .. | 26,250 | 15,400 |
| Pig Mixture .. .. .. | 3,800 | 7,000 |
| Sow Ration .. .. .. | 7,840 | 182,522 |
| Goat Feed .. .. .. | 250 | 200 |
| Mule and Horse Feed .. .. | 44,644 | 46,700 |
| Total | 2,021,476 | 2,470,627 |

Corn

381. Purchase of local corn amounted to 760,722 lb. at an average price of 6¼ cents per lb. This represents an increase of 187,385 lb. over 1955 when the price was 6½ cents per lb.

Corn Meal

382. Production of this product was increased due to greater availability of local corn at a more favourable price and also because merchants found it more advantageous to purchase the local product.

383. Comparative details of corn meal manufactured in 1955 and 1956 are as follows:-

| | 1955 lb. | 1956 lb. |
|---|---|---|
| Amount of corn meal manufactured .. | 22,603 | 46,242 |
| " " " germ manufactured .. | 1,054 | 2,344 |
| " " " bran manufactured .. | 10,426 | 24,282 |

Plantain Flour

384. At various periods of the year plantains became available in sufficient quantity to warrant the manufacture of this by-product. Plantains were purchased at an average cost of 5¼ cents per lb., and the cost of production was 36.41 cents per lb.. Comparative details of manufacture are as follows:-

| | 1955 lb. | 1956 lb. |
|---|---|---|
| Plantains purchased .. .. .. | 15,000 | 20,000 |
| Plantain flour manufactured .. .. | 3,270 | 4,597 |
| Plantain flour sold .. .. | 5,470 | 4,694 |

385. The manufacture of plantain flour was discontinued towards the close of the year as the space occupied by the drier and other equipment was required for the additional machinery which was to be installed in connection with the rapidly expanding feed mixing operations of the factory.

Cassava Flour

386. Manufacture of this by-product has been discontinued on economic grounds.

Development of Agricultural Products and Canning

387. Only small scale canning operations were carried out. On economic grounds the canning of pineapples was not undertaken. For the reason stated in connection with the discontinuation of plantain flour manufacture, all canning machinery was dismantled.

(III) LIVESTOCK CONTROL ORGANISATION

388. Operation of the organisation covered a period of 9 months, January to September, after which the control of livestock and meat was discontinued by Government.

389. A total of 5,557 head of cattle valued $602,724.12 was purchased as follows:-

| | | | Average price per head |
|---|---|---|---|
| Georgetown | 3,383 head valued | $375,368.05 | $110.96 |
| Rupununi (by air) | 1,603 " " | 172,799.42 | 107.80 |
| New Amsterdam | 571 " " | 54,556.65 | 95.55 |
| Total | 5,557 " " | $602,724.12 | $108.46 |

Of the 3,383 animals purchased in Georgetown, 276 came from the Rupununi District and 3,107 were from coastal areas.

390. The weight of beef transported by air craft from the Rupununi was 1,596,287 lb. over a period of 9 months, as against the previous highest total of 1,562,731 lb. transported during the whole of 1955.

391. Transportation of offal, heels and hides by air craft from the Rupununi was as set out hereunder:-

| | By Air Craft | | | Local Slaughter |
|---|---|---|---|---|
| | Offal | Heels | Hides | Hides |
| | lb. | lb. | lb. | lb. |
| 1955 | 18,858 | 12,858 | 98,061 | 100,689 |
| 1956 | 2,812 | 2,830 | 12,994 | 110,013 |

The figures for hides from slaughterings at the Georgetown Municipal Abattoir are submitted by way of interest and comparison.

392. A decrease in available coastal cattle and restrictions against marketing Rupununi cattle through the trail compelled extensive reliance on beef transported by air craft from the Rupununi. Abnormal adverse weather conditions added to the difficulties of supply, as the coastal ranching companies were virtually cut off. There is little doubt that the shortage of coastal cattle was more apparent than real, producers having been influenced into holding up sales in view of the then impending abolition of Livestock Control.

(IV) HAM AND BACON PLANT

393. The plant again demonstrated how very essential its existence is to the continued improvement and expansion of the pig industry. Its primary purpose is to provide farmers with an assured market at fair economic prices for pigs of a quality suitable for processing.

394. The supply of pigs offered for sale to the division far exceeded the requirements of the factory, which had to limit production to actual demand. This led to considerable dissatisfaction among farmers, as their pigs did not always find a ready market. The original policy governing operation of the factory had, therefore, to be revised in order to permit of the general sale of pork by retail and wholesale, as well as allow of export.

395. A total of 1,742 pigs weighing 193,450 lb. was purchased for $98,141.43.

396. The sale of residual and other cuts of pork for the year amounted to $48,764.55. Sale of the residual cuts and other end products continued to prove a boon to the poorer classes, as most of these were sold cheaply to obviate accumulation with resultant loss.

397. An export market for frozen pork was sought and obtained in Trinidad. A trial shipment was made in October, when the division shipped 1,673 lb. of pork sides. This lot was very favourably received, and by year end a total of 8,170 lb. had been disposed of by this means.

398. Prospects for the future of this export trade would appear to be favourable, provided, however, that the

requirements of the market can be met, both as regards quantity and quality, and also that farmers' prices permit the sale of pork to this market on a competitive basis with other sources of supply.

399. Production of finished products for the year was as follows:-

| | | |
|---|---|---|
| Ham | - | 14,862 lb. |
| Bacon | - | 39,855 " |
| Sausages | - | 7,858 " |
| Lard | - | 7,324 " |

400. Consumer reaction to the products of the factory continued to be gratifying. However, despite favourable support by certain leading merchants, the importation of considerable quantities of bacon and ham continued to handicap and limit production. Nevertheless, general opinion weighs heavily in favour of the local product. Existence of the factory undoubtedly is filling a long felt want, while at the same time contributing to the general economy of the country by lowering the cost of those products which it manufactures and providing a profitable means of livelihood for a large number of persons in the rural areas.

(V) MILK CONTROL ORGANISATION

401. A total of 253,840 gallons of milk valued at $166,516.48 was purchased from producers or accredited collectors. This represents an increase of 44,701 gallons on the previous year's purchases which amounted to 209,138 gallons valued $136,666.70. The total value of sales for the year was $176,163.61. Supplies available to the organisation continued to show a steady increase for the first 9 months. The last 3 months showed a sharp decline.

Cream

402. A total of 45,796 gallons of milk was separated for ultimate manufacture into ghee.

Ghee

403. A total of 14,262 lb. of ghee was manufactured from the cream produced.

Recombined Milk

404. A total of 4,866 gallons of recombined milk valued $3,170.98 was manufactured by converting 4,080 lb. skimmed milk powder, 253 lb. glucose and 1,657½ lb. ghee to meet the demand due to the decline in supply from producers during the last 3 months.

Milk Pasteurisation Plant

405. Work was begun on the erection of the Milk Pasteurisation Plant in Georgetown. Bridges, foundations and floors were laid by year end.

## F. BOTANICAL GARDENS

406. The Gardens were well maintained and improved despite another wet year. The 2 drainage trenches alongside the main avenue were cleared and re-dug by draglines. The playground shelter was rehabilitated using wallaba shingles. The other shelters will be similarly rehabilitated in 1957. A number of hedges and beds of shrubs was grubbed out and replaced with collections of Lagerstromia indica, Oleanders and Ixora. A total of 4,608 economic fruit trees, mainly oranges and 5,106 ornamentals was sold to the public together with 26,392 packets of vegetable seeds and 988 lb. of Black-eye peas and peanuts. In addition 767 packets of vegetable seeds and 4½ lb. of Black-eye peas were distributed free to district stations, school gardens and Government institutions.

## G. GENERAL AGRICULTURAL CENSUS

### General Agricultural Census 1956

407. A sample of a little over 10,200 farms on the coastal belt and along the rivers and creeks to the limits of settlements, including the Rupununi District, was taken to provide comprehensive data on agriculture in the Colony. This represents about 20% of the total number of farms in the Colony. The census is intended to provide up-to-date information on major and important crops, and was designed to indicate trends and changes in agriculture since the first sample census was taken in 1952.

408. Most of the time of the Agricultural Economist and his staff was taken up with preparations for the above census. The census was made more difficult by the resignation of the Agricultural Economist in August.

## H. METEOROLOGICAL DIVISION

409. A separate report is issued on the work of this division.

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## SECTION III

## COLONIAL DEVELOPMENT AND WELFARE SCHEMES

410. The following Research Schemes were in operation and have been reported on under Section II, B. Research and Experimentation:

(a) Cotton Investigations
(b) Hosororo Experiment Station
(c) Ebini Livestock Station
(d) St. Ignatius Livestock Station
(e) Cacao Development Scheme
(f) Jute Experiments
(g) Soil Survey Coast
(h) Soil and Land Use Survey - Interior
(i) Central Agricultural Station
(j) Sugar-Cane Diseases Research
(k) Fertilizer Investigations on Rice.

In addition, the following schemes were administered by the Department:

Refrigeration Plant and Abattoir, Lethem

411. The abattoir was put into operation and resulted in greatly improved slaughtering conditions. Hygienic conditions were also vastly improved. The Cold Storage Plant was put into operation towards the end of the year but was not well patronized because of consumer resistance in Georgetown to chilled and frozen beef. Meat discolouration played a large part in consumer resistance. The construction of simple housing for the 2 refrigeration mechanics was commenced. It was found impossible to rent any houses for these men.

Staff Training

412. Five serving Agricultural Instructors, 2 recruits and 1 Prison Officer completed the second one-year course at the Eastern Caribbean Farm Institute in July.

413. One Agricultural Instructor, 3 recruits and 1 Prison Officer were sent in October for the first two-year course of training at the Institute.

Fisheries - Inland and Sea

414. A start was made on the lay-out and construction of the pilot brackish and fresh water fish ponds at Onverwagt. The intake sluice and canal for the taking in of brackish water was completed and 2 ponds excavated before funds were exhausted. Construction work was greatly handicapped by wet weather resulting in increased costs. The cost of the project was underestimated and the scheme will have to be revised as only about one tenth of the construction work has been completed.

415. Some improvement in rural landing facilities was achieved and the Wholesale Fish Market was virtually completed by the end of the year. One fish drying floor was erected and plans were obtained for an all purpose coastal fish survey vessel but no order was placed.

## INTERNATIONAL CO-OPERATION ADMINISTRATION OF U.S.A.

### Technical Assistance

416. The International Co-operation Administration continued to give valuable assistance to the Department. During the year, the following Technicians, whose work is included elsewhere in this report, were attached to the Department.

| | | | |
|---|---|---|---|
| (a) | Poultry Specialist | - | Dr. N. Paulhus |
| (b) | Information Specialist | - | Mr. A. Feeney |
| (c) | Farm Youth Specialist | - | Mr. S. Sutton |
| (d) | Soil Surveyors | - | Mr. C. Simonson |
| | | | Mr. D. Crocker |

417. International Co-operation Administration also arranged "on-farm-training" in the U.S.A. for young farmers.

418. A helicopter was provided by International Co-operation Administration to expedite the reconnaissance soil survey of the coastlands of British Guiana from the Essequibo to the Courantyne Rivers.

## BOARDS AND COMMITTEES

419. The Director of Agriculture served as Chairman of the following Boards and Committees:-

- Sugar Industry Price Stabilisation and Rehabilitation Funds Committee.
- Berbice Fibre Research Company Limited.
- Sugar Experiment Stations' Committee.
- Committee for fixing rents of rice lands, etc.
- Advisory Committee on Milk Marketing.

420. The Director also served as a member of the following Boards and Committees:-

- B.G. Rice Marketing Board.
- B.G. Rice Marketing Board - Executive Committee.
- Selection Committee for Imperial College of Tropical Agriculture Scholars.
- Davson Memorial Fund Committee.
- Scholarship Selection Committee.
- Museum Committee (Board of Trustees for the Georgetown Cultural Centres).
- Land Settlement Advisory Committee.
- Pig Rearing Industry Committee.
- Development Programme Technical Co-ordination Committee.
- Duty-free and Drawback Gasolene Committee.
- Ad Hoc Committee to advise ILO Consultant on employment and underemployment.

421. He served as Director of the B.G. Rice Development and Berbice Fibre Research Companies and also of the Royal Agricultural and Commercial Society.

422. The Director attended the following meeting held outside the Colony:-

Advisory Council of Agriculture, Animal Health and Husbandry, Forestry and Fisheries, St. Vincent.

## SENIOR STAFF CHANGES

423. The following changes of staff occurred during 1956:-

Appointments

Mr. G.B. Kennard, Deputy Director (Marketing and Land Settlement).
Mr. M.D. ffrench-Mullen, Deputy Director (Administration).
Mr. P.A. Chan-Choong, Assistant Director (Extension).
Dr. P.F. Byrne, Veterinary Officer.
Dr. G.D. Paine, Veterinary Officer.
Dr. B. Heyworth, Veterinary Officer.
Mr. J. Stark, Soil Surveyor.
Mr. H. Hill, Soil Surveyor.
Mr. S.P. Legg, Research Officer.
Mr. P. Poonai, Agricultural Superintendent.
Mr. D.I. Allen, Agricultural Engineer.
Mr. E. Cundiff, Agricultural Officer.

Promotions

Mr. G. B. Kennard, Assistant Director (Field and Extension) to Deputy Director.
Mr. P.A. Chan-Choong, Economic Botanist to Assistant Director (Extension).
Mr. M.A. Shariff, Grade II Technical Assistant to Grade I Technical Assistant.
Mr. O.F. Ross, Grade II Agricultural Instructor to Grade I Agricultural Instructor.
Mr. I.C. Agard, Grade II Agricultural Instructor to Grade I Agricultural Instructor.
Mr. K.C.L. Millington, Grade II Agricultural Instructor to Grade I Agricultural Instructor.
Mr. H. Madramootoo, Assistant Agricultural Superintendent to Agricultural Superintendent.
Mr. D. Singh, Class II Clerk to Class I Clerk.
Miss M. Cheong, Secretary to Senior Woman Secretary.

Transfers

Mr. S.A. Angoy, Chief Clerk to Chief Secretary's Office.

Mr. W.J. Alexander, Class II Clerk to Magistrates Department.
Mr. J. Blair, Class II Clerk to Post Office.
Mr. V.E.R. Basdeo, Class II Clerk to Social Assistance.
Miss E.G. Harper, Clerical Assistant to Local Government.
Miss C.E. Pollard, Senior Clerical Assistant to Post Office.
Miss V.M. Shaw, Senior Clerical Assistant to Lands and Mines
Mr. M.N. Dundas, Grade II Technical Assistant to Government Information Services.
Mr. J.A. Brassington, Agricultural Instructor to Land Settlement.
Mr. B.G.C. Henry, Grade II Technical Assistant seconded as Grade I Technical Assistant, Education.

Retirements

Mr. C.A.N. Persaud, Grade I Technical Assistant.

Leave

Mr. A.P. Mackenzie, Director of Agriculture.
Mr. R.O. Williams, Assistant Director (Research).
Mr. W.H.L. Allsopp, Fishery Officer (Inland).
Mr. G.E. Wolstenholme, Curator.
Dr. E.M. Mc Watt, Veterinary Officer.
Mr. E.J.A. Khan, Assistant Chemist.
Mr. C.A. Vieira, Farm Manager.
Mr. H.A. Cole, Assistant Agricultural Superintendent.
Mr. H. Mairamootoo, Assistant Agricultural Superintendent.
Mr. C.L.A. Mittelholzer, Class I Clerk.
Mr. K. Croal, Grade II Technical Assistant.
Mr. G.H. Greene, Grade II Technical Assistant.
Mr. M. Ramnarine, Assistant Agricultural Superintendent.
Mr. B.B. Trotman, Grade II Agricultural Instructor.
Mr. A.A. Benn, Grade II Agricultural Instructor.
Mr. M. Sheriff, Grade I Technical Assistant.
Mr. S.A. Mapp, Grade II Agricultural Instructor.
Mr. A.C. Lam, Senior Accounting Officer.
Mr. J.K. Sagar, Class II Clerk.
Mr. J. Hackett, Captain-Engineer, North West District.

## OFFICIAL VISITORS - 1956

424. Officials visitors from overseas for the year were as follows:-

| | | |
|---|---|---|
| Mr. D. Rhind | - | Secretary for Colonial Agricultural Research |
| Dr. H. Greene | - | Adviser on Tropical Soils, Rothamsted Experimental Station |
| Mr. R.L. Cheaney<br>Mr. Hoosjes<br>Mr. Driebergen<br>Mr. M.J. Lindner | - | U.S. Fish Wild Life Service |
| Mr. J. Hoock | - | Botanist, Cayenne, French Guiana |
| Mr. A. de K. Frampton | - | Agricultural Adviser to the Comptroller, Development and Welfare |
| Mr. Lijding | - | Head, Fisheries Division, Suriname |
| Mr. Engelage<br>Mr. Poerema | - | Engineers |

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## SECTION IV

## LEGISLATION

### Summary of Legislation affecting Agriculture enacted during 1956

| Ordinances | Purposes |
|---|---|
| No. 30 - The Fisheries Ordinance, 1956. | To regulate fishing in the waters of the Colony. |
| 31 - The Rice Farmers (Security of Tenure) Ordinance, 1956. | To provide better security of tenure for tenant rice farmers; to limit the rent payable for the letting of rice lands; and for purposes connected with the matters aforesaid. |
| **Orders in Council** | |
| No. 11 - The Rice (Cess) Order, 1956. | To state cess on various grades of rice. |
| 14 - The Animal Diseases (Anthrax) Order, 1956. | To restrict removal of animals, etc. with Anthrax. |
| 27 - The Animal Diseases (Anthrax No. 2) Orders, 1956. | To restrict the removal of animals, etc. from Mc Kenzie. |
| 28 - The Animal Diseases (Prohibition of Importation) Order, 1956. | To prohibit entrance of animals, etc. from Canada. |
| 32 - The Animal Diseases (Anthrax) (Revocation) Order, 1956, Cap. 258. | To revoke Order No. 14 of 1956. |
| 33 - The Animal Diseases (Foot-and-Mouth Disease) (Revocation) Order, 1956, Cap. 258. | To revoke Order No. 51 of 1954. |
| 47 - The Animal Diseases (Anthrax No. 2) (Revocation) Order, 1956. | To revoke Order No. 27 of 1956. |
| 48 - The importation of Poultry Carcases (Control) Order, 1956. | To specify the condition of imported poultry and to rescind Order No. 24 of 1955. |
| 67 - The Animal Diseases (Foot-and-Mouth Disease) Order, 1956. | To establish boundaries of Foot-and-Mouth Disease area. |
| 68 - The Animal Diseases (Foot-and-Mouth Disease) (No. 2) Order, 1956. | To establish boundaries of Foot-and-Mouth Disease area and rescind Order No. 52 of 1954. |

| | Regulations | Purposes |
|---|---|---|
| No. 10 - | The Animal Diseases (Foot-and-Mouth) (No. 2) (Revocation) Regulations, 1956. | To revoke Regulation No. 14 of 1954. |
| 13 - | The importation of Fruits and Vegetables (Temporary Provisions) Regulations, 1956. | To restrict the importation of fruit from the U.S.A. |
| 24 - | The Rice Farmers (Security of Tenure Regulations, 1956. | To state working conditions under the Rice Farmers (Security of Tenure) Ordinance. |

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## APPENDIX

## SENIOR STAFF OF THE DEPARTMENT AS AT

## 31ST DECEMBER, 1956

| | |
|---|---|
| Director .. .. .. | A.F. Mackenzie, B.Sc. (Hons.) (Lond.), A.R.C.S., A.I.C.T.A. |
| Deputy Director (Administration) | M.D. ffrench-Mullen, D.I.C.T.A., A.I.C.T.A. |
| Deputy Director (Land Settlement and Marketing) | G.B. Kennard, D.I.C.T.A., A.I.C.T.A. |
| **RESEARCH AND LABORATORIES** | |
| Assistant Director (Research) | R.O. Williams, D.I.C.T.A., A.I.C.T.A. |
| Entomologist .. .. | J.H. Proctor, B.Sc. (Hons.) (Wales), D.T.A. (Trin.) |
| Economic Botanist .. .. | Vacant |
| Agricultural Superintendent, Botany .. .. .. | P. Poonai, D.I.C.T.A., A.I.C.T.A. |
| Plant Pathologist .. .. | J.A. Pires, B.S.A., M.S.A. |
| Padi Pest Research Officer .. | L.D. Cleare, F.R.E.S. |
| Agricultural Economist .. | Vacant |
| Sugar Agronomist .. .. | L.S. Birkett, D.I.C.T.A., A.I.C.T.A. |
| Rice Agronomist .. .. | Vacant |
| Chemist .. .. .. | H. Paul, B.Sc. (Lond.) M.Sc. (Mc Gill), D.I.C. (Lond.) F.R.I.C. (Exam) |
| Agricultural Engineer .. | D.I. Allen, N.D.A. |
| Research Officer, Ebini .. | S.P. Legg, B.Sc. |
| Agricultural Officer, St. Ignatius .. .. | E. Cundiff, B.Sc. |
| Fishery Officer (Inland) .. | W.H.L. Allsopp, M.Sc. (Wisc.) |
| Fishery Officer (Marine) .. | E.A. Shepherd |
| Curator .. .. .. | G.E. Wolstenholme |
| Assistant Chemist .. .. | E.J.A. Khan, B.Sc. (Edin.) |
| **VETERINARY AND ANIMAL HUSBANDRY** | |
| Assistant Director (Veterinary and Animal Husbandry) .. | J.M. Fletcher, M.R.C.V.S. |
| Veterinary Officer .. .. | G.D. Paine, M.R.C.V.S. (Lond.) |
| Veterinary Officer .. .. | D.L. Diamond, D.V.M. (Ont.) |

| | |
|---|---|
| Veterinary Officer .. .. | D.M. Mc Watt, D.V.M. (Ont.) |
| Veterinary Officer .. .. | P.F. Byrne, M.R.C.V.S. (Dublin) |
| Veterinary Officer .. .. | B. Heyworth, M.R.C.V.S. (Glosg.) |
| Livestock Officer .. .. | E.I. Hugh, M.S. (Iowa), B.Sc. Agric. (Mc Gill) D.I.C.T.A. Dip. Agric. (Read.) |
| Farm Manager, St. Ignatius Station .. .. .. | C.A. Vieira |
| Farm Manager, Georgetown .. | C.A. Bannister, Dip. Agric. |
| Farm Manager, Ebini .. | T.F. Kenyon |
| Senior Technical Assistant .. | C.A. Veerasammy |

AGRICULTURAL EXTENSION

| | |
|---|---|
| Assistant Director (Field and Extension) .. .. | P.A. Chan-Choong, B.Sc. (Hons.) (Lond.) A.I.C.T.A. |
| Superintendent of Rural Youth Work .. .. | O.F. Churaman, D.I.C.T.A. |
| Assistant Superintendent, Rural Youth Work (Temporary) | Mrs. C. Churaman, B.Sc. (Home Econ.) |
| Agricultural Superintendent, Essequibo .. .. | L. Kong, B.Sc. (Mc Gill) |
| Agricultural Superintendent, Berbice .. .. .. | A.V. Wan Ping, B.Sc. (Mc Gill), D.I.C.T.A. |
| Agricultural Superintendent, East Coast, Demerara .. | W.R. Asfour, B.Sc. (Wales), M.S. (Utah) |
| Agricultural Superintendent, (Education) .. .. | B.O. Ho-Yen, M.Sc. (Mc Gill) B.Sc., D.I.C.T.A. |
| Agricultural Superintendent, seconded to Rice Development Company .. .. .. | E.G. Giglioli, B.Sc. (Agric.) (Mc Gill) |
| Agricultural Superintendent, North West District .. | H. Madramootoo, B.S.A. (Br. Colombia) |
| Agricultural Superintendent | Vacant |
| Agricultural Superintendent | Vacant |
| Assistant Agricultural Superintendent, West Coast, Demerara | H.A. Cole |
| Assistant Agricultural Superintendent .. .. | M. Ramnarine, Dip. (Wye Agric. College). |
| Assistant Agricultural Superintendent .. .. | Vacant |
| Assistant Agricultural Superintendent .. .. | Vacant |
| Assistant Agricultural Superintendent .. .. | Vacant |

MARKETING DIVISION

| | |
|---|---|
| General Manager .. .. | C.I.V. Mittelholzer |
| Chief Accountant .. .. | G.F. Chan |
| Marketing Officer .. .. | Vacant |
| Manager, Government Produce Depot .. .. .. | Vacant |
| Dairy Manager .. .. | A.F. Singleton |
| Secretary-Accountant, Milk Marketing Organisation .. | D. Seeram |
| Manager, Processing Factory | L. Paul |

SENIOR ADMINISTRATIVE STAFF

| | |
|---|---|
| Executive Officer .. .. | Vacant |
| Accountant .. .. .. | Vacant |

OFFICERS WORKING ON COLONIAL DEVELOPMENT AND WELFARE SCHEMES

| | |
|---|---|
| Cotton Officer .. .. | C.H. Brown, B.Sc. |
| Soil Surveyor (on loan from I.C.T.A.) .. .. | G.K. Rutherford, B.Sc. |
| Soil Surveyor .. .. | J. Stark, B.Sc. |
| Soil Surveyor .. .. | H. Hill |

INTERNATIONAL CO-OPERATION ADMINISTRATION PERSONNEL

| | |
|---|---|
| Swine Specialist .. .. | M. Kerr, M.S. |
| Poultry Specialist .. .. | N. Paulhus, Ph.D. |
| Information Specialist .. | A. Feeney, B.A. |
| Farm Youth Specialist .. | S. Sutton |
| Soil Surveyor .. .. | C. Simonson, B.Sc., M.Sc. |

FOOD AND AGRICULTURAL ORGANISATION PERSONNEL

| | |
|---|---|
| Research Officer, Ebini Livestock Station .. | J.R. Goode, B.Sc. |

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